

**H.R. 4979, THE ADVANCED NUCLEAR TECHNOLOGY DEVELOPMENT ACT OF 2016, AND
H.R. _____, THE NUCLEAR UTILIZATION OF
KEYNOTE ENERGY POLICIES ACT**

HEARING

BEFORE THE
SUBCOMMITTEE ON ENERGY AND POWER
OF THE
COMMITTEE ON ENERGY AND
COMMERCE
HOUSE OF REPRESENTATIVES
ONE HUNDRED FOURTEENTH CONGRESS

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**H.R. 4979, THE ADVANCED NUCLEAR TECHNOLOGY DEVELOPMENT ACT OF 2016, AND
H.R. _____, THE NUCLEAR UTILIZATION
OF KEYNOTE ENERGY POLICIES ACT**

FRIDAY, APRIL 29, 2016

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND POWER,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 9:34 a.m., in room 2123, Rayburn House Office Building, Hon. Ed Whitfield (chairman of the subcommittee) presiding.

Present: Representatives Whitfield, Shimkus, Latta, McKinley, Kinzinger, Long, Rush, McNerney, Tonko, Green, Doyle, Castor, Welch, and Loeb sack.

Staff Present: Will Batson, Legislative Clerk, E&P, E&E; Allison Busbee, Policy Coordinator, Energy & Power; Tom Hassenboehler, Chief Counsel, Energy & Power; A.T. Johnston, Senior Policy Advisor; Chris Sarley, Policy Coordinator, Environment & Economy; Dan Schneider, Press Secretary; Peter Spencer, Professional Staff Member, Oversight; Andy Zach, Counsel E&E; Jeff Carroll, Minority Staff Director; Rick Kessler, Minority Senior Advisor and Staff Director, Energy and Environment; John Marshall, Minority Policy Coordinator; Dan Miller, Minority Staff Assistant; Alexander Ratner, Minority Policy Analyst; Tim Robinson, Minority Chief Counsel; Andrew Souvall, Minority Director of Communications, Outreach and Member Services; and Tuley Wright, Minority Energy and Environment Policy Advisor.

OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF KENTUCKY

Mr. WHITFIELD. I would like to call the hearing to order this morning. I recognize myself for 5 minutes.

Good morning, and welcome to our hearing to discuss legislative proposals to advance the use of nuclear energy.

I want to thank all of our witnesses in advance, and I will be introducing each of you before your 5-minute opening statement.

But we want to thank Marvin Fertel for the great job he did at the Nuclear Energy Institute, and I think it is his plan to go on and look at other challenges at the end of this year. So we are delighted he is here. He has served as NEI's president and chief executive officer.

utive officer since 2009 and has had a long and distinguished career advocating for the nuclear industry.

Nuclear energy is an integral part of our energy policy. The current fleet of roughly 100 operating nuclear power plants safely and reliably generates about 20 percent of our Nation's electricity. However, many of these power plants are approaching the end of their current license, and unnecessary regulatory costs are adding to challenging economic conditions.

This outlook provides a timely opportunity to examine proposals to improve the regulatory framework for nuclear power plants and options to develop a regulatory framework for advanced nuclear technologies.

New nuclear technologies hold great promise to operate in a cost-competitive environment with even greater safety margins than existing reactors while generating less waste and reducing proliferation concerns. However, regulatory uncertainty is repeatedly cited as a top barrier to developing these technologies. The Department of Energy, which supports nuclear research and development activity, should collaborate, where applicable, with the NRC to address this uncertainty.

Today, we are going to hear from stakeholders about how to more effectively manage the regulatory process, including options to increase the efficiency and certainty of the NRC's existing licensing process. Representative Kinzinger's discussion draft highlights that cumbersome red tape in our regulatory process forces ratepayers to pay more for safe, clean nuclear power, and I want to thank him for his legislation, and we look forward to your comments about that.

Also, I certainly appreciate Congressman Latta's leadership in addressing regulatory barriers hindering the development of advanced nuclear technologies. His legislation, the Advanced Nuclear Technology Development Act, will assure that DOE's technical expertise, research, and facilities are utilized, when appropriate, to assist the NRC.

And at this time, I would like to yield a minute or so to Mr. Latta, and then I will yield to Mr. Kinzinger, for their comments on their legislation.

[The prepared statement of Mr. Whitfield follows:]

PREPARED STATEMENT OF HON. ED WHITFIELD

Nuclear energy is an integral part of an "all of the above" energy policy. The current fleet of 100 operating nuclear power plants safely and reliably generates about 20 percent of our nation's electricity. However, many of these power plants are approaching the end of their current license and unnecessary regulatory costs are adding to challenging economic conditions. This outlook provides a timely opportunity to examine proposals to improve the regulatory framework for nuclear power plants and options to develop a regulatory framework for advanced nuclear technologies.

I have raised concerns in previous oversight hearings about the Nuclear Regulatory Commission's (NRC) discipline in its regulatory activities and responsiveness to NRC licensees. It is Congress' responsibility to consider how these activities can be improved while assuring adequate protection of public health and safety. I am confident we can identify efficiencies to assure NRC adheres to their Principles of Good Regulation, while fulfilling their critical mission.

New nuclear technologies hold great promise to operate in a cost competitive environment, with even greater safety margins than existing reactors while generating less waste and reducing proliferation concerns. However, regulatory uncertainty is repeatedly cited as a top barrier to developing these technologies. The Department

of Energy, which supports nuclear research and development activities, should collaborate where applicable, with the NRC to address this uncertainty.

Today we will hear from stakeholders about how to more effectively manage the regulatory process, including options to increase the efficiency and certainty of the NRC's existing licensing process. Representative Kinzinger's discussion draft highlights that cumbersome red tape in our regulatory process forces ratepayers to pay more for safe, clean nuclear power.

I appreciate Congressman Latta's leadership to address regulatory barriers hindering the development of advanced nuclear technologies. His legislation, the Advanced Nuclear Technology Development Act, will assure that DOE's technical expertise, research, and facilities are utilized when appropriate to assist the NRC. This legislation also requires the NRC to draft the regulatory roadmap for the scores of companies who need a regulatory framework for 21st century nuclear technologies.

Mr. LATTA. Well, thank you very much, Mr. Chairman. Thanks for yielding.

And thanks for our panel for being with us today.

I would like to again thank you for holding this hearing today on nuclear power, which is highlighting the bill Congressman McNerney and I introduced last week, H.R. 4979, the Advance Nuclear Technology Development Act of 2016.

I would like to ask unanimous consent, Mr. Chairman, to enter several letters of support into the record. These letters are from the Nuclear Energy Institute, the American Nuclear Society, and ClearPath.

Mr. WHITFIELD. Without objection.

[The information appears at the conclusion of the hearing.]

Mr. LATTA. Thank you very much.

The future of the nuclear industry needs to start now with Congress ensuring that the Nuclear Regulatory Commission is able to provide the certainty that the private sector needs to invest in innovative technologies. Nuclear power is currently 20 percent of our national energy portfolio and must remain a vital part of our energy mix.

As the United States looks to the future, more energy will be needed, and nuclear power provides a reliable, clean baseload power option. Investment in new technologies is already happening with approximately 50 companies in this country working to develop the next generation of nuclear power.

And again, that is why we have introduced H.R. 4979. It is time for Congress to ensure that NRC provides a framework so that innovators and investors can prepare to apply for licensing technologies. H.R. 4979 not only requires that NRC establish a regulatory framework for issuing licenses for advanced nuclear reactor technology, but it also requires that NRC submit a schedule for implementation of the framework by 2019.

Safety in nuclear is the number one goal, and the regulatory framework ensures that NRC has the opportunity to develop a framework that enables them to safely regulate the future technology of the nuclear industry. H.R. 4979 also requires that the Department of Energy and the NRC collaborate in advancing new nuclear technology. The National Labs in DOE provide opportunities for testing of new nuclear technology on Federal lands and the option to look at public-private partnerships between the DOE and the private sector companies interested in investing in the future of nuclear.

There is also a role for the NRC in this space because these testing opportunities allow for a demonstration of technologies that NRC has not been licensing over the past 4 years.

And, Mr. Chairman, I greatly appreciate you holding this hearing, and I yield back to you. Thank you very much.

Mr. WHITFIELD. Mr. Kinzinger, Mr. Upton is not going to be here, so I want to give you his time.

Mr. KINZINGER. Thank you.

Mr. WHITFIELD. And then if Mr. Latta wants to talk some more, he can talk some more too then.

At this time I recognize Mr. Rush for his 5-minute opening statement.

OPENING STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. RUSH. I want to thank you, Mr. Chairman, for holding this important hearing today on H.R. 4979, the Advanced Nuclear Technology Development Act of 2016, and the Nuclear Utilization of Keynote Energy Policies Act.

Mr. Chairman, as we move towards a reduced carbon sustainable energy economy, there is no doubt that nuclear energy will need to play an instrumental role in order to reach those objectives. While today's fleet of nuclear reactors utilize light-water reactor technology, more attention is now being paid to the use of non-LWR reactor designs that have been demonstrated by the Department of Energy but are currently not licensed for commercial use in the United States.

In fact, Mr. Chairman, emerging innovative designs of advanced nonlight-water reactors and light-water small modular reactors have the potential to produce nuclear power more efficiently and with less waste than the current technologies.

If we are to truly develop and scale up these technological advances, it is important that policymakers and the Nuclear Regulatory Commission provide regulatory certainty for the nuclear industry in order to encourage investment in these next-generation nuclear designs.

So I applaud my colleagues, Mr. Latta and Mr. McNerney, for introducing H.R. 4979. This legislation seeks to provide guidance and direction to the NRC and the DOE to ensure that these two agencies have sufficient technical expertise in order to support and regularly advance reactor technology.

The rule also requires the NRC to formulate a plan that would help foster civilian research and development of advanced nuclear energy technologies and enhance the licensing and commercial development of such technologies.

Mr. Chairman, I fully support the intent of this legislation. I look forward to hearing feedback from our panel of experts on both the necessity for this type of legislation and the implications once it is enacted. In regards to the Nuclear Utilization of Keynote Energy Policies Act, I also look forward to engaging the witnesses on this legislation.

Mr. Chairman, finally, if nuclear energy is going to continue to play a constructive role in a reduced carbon energy portfolio, we must ensure that we have policies in place that appropriately re-

flect the contributions of the industry and the current reality that it faces. So I commend my colleague from Illinois, Mr. Kinzinger, for introducing a bill draft that at the very least initiates a conversation toward reaching this goal.

Of course, Mr. Chairman, today's bill is simply a discussion draft, and we would need to hear from the NRC commissioners themselves before moving into the legislative process. But I look forward to today's hearing, and I look forward to testimony from today's experts on both the need for the changes outlined in the bill as well as the practical implications if these changes were indeed enacted.

I want to thank you, Mr. Chairman. I yield back the balance of my time.

Mr. WHITFIELD. The gentleman yields back.

At this time I recognize Mr. Kinzinger for 5 minutes. And if some others who want some of your time, you might consider yielding to them. Thank you.

Mr. KINZINGER. Sure. This will be fairly quick.

Mr. Chairman, I want to thank you for holding the hearing, and I want to thank each of the witnesses for being here today. It is an important topic.

As we have heard, nuclear power generates about 20 percent of electricity in the United States, and in Illinois it is over 50 percent, including 60 percent of our Nation's carbon-free electricity. These plants are high performing, consistently having the highest capacity factors by far in the electricity industry and setting the gold standard for commercial nuclear safety worldwide.

We have to recognize, however, that while our nuclear fleet is strong today, the demand for clean, reliable, and affordable energy is only increasing. We have an obligation to safely maintain our existing fleet of 99 units and to ensure the NRC continues to regulate efficiently and effectively so investment in plants can continue.

The regulatory inefficiency and uncertainty we often see today does nothing to help our existing fleet, does nothing to foster investment in new plants, or most importantly, to ensure safety and protect public health.

I want to thank the NRC for providing me with technical feedback on this draft, which we are currently reviewing, and I look forward to continuing to work with them throughout this process. Furthermore, I appreciate the interest in my colleagues in this issue addressed in my discussion draft, including establishing fair and more equitable NRC fees, streamlining the licensing process, and improving the current regulatory framework for decommissioning plants. These are all important conversations to have so that nuclear power can continue to provide clean, reliable, and affordable electricity to ratepayers in the United States.

Again, I welcome this opportunity to discuss how we can maintain our Nation's position as the global leader in civilian nuclear power and NRC's position as the gold standard of safety. I think all of us who are in this room recognize that if we cede the position, it will have serious consequences not only for our economy but also for our national security.

With that, Mr. Chairman, I am happy to yield to anybody who wants my time.

Mr. WHITFIELD. Anybody on our side seek additional time?

Mr. KINZINGER. Great. I yield back.

Mr. WHITFIELD. OK. Yields back.

At this time I recognize the gentleman from California, and thank him very much for cosponsoring this legislation as well, for 5 minutes.

OPENING STATEMENT OF HON. JERRY MCNERNEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. MCNERNEY. Thank you, Mr. Chair.

Our Nation will, by necessity, diminish our dependence on fossil fuels in order to fight climate change, and as we do so, we will need to turn more and more to nuclear power.

H.R. 4979, the bill that my colleague, Mr. Latta, and I introduced, allows the NRC to develop the needed technical expertise for emerging technologies. This legislation provides a pathway for the NRC and the DOE to continue collaborating and establishes a regulatory framework for consideration of licensing advanced reactors. This will help ensure that as newer, safer technologies are developed, that the NRC has the framework in place to review new applications.

Mr. Chairman, with unanimous consent, I would like to submit three letters, one from Berkeley's Nuclear Engineering Department, one from Third Way, and one from the Clean Air Task Force, into the record.

Mr. WHITFIELD. Without objection.

[The information appears at the conclusion of the hearing.]

Mr. MCNERNEY. And I will yield the balance of my time to my colleague from Pennsylvania.

Mr. DOYLE. And I thank my colleague.

I want to thank the chairman and the ranking member for holding this important hearing today. To me, nuclear is a critical component of our energy future. We need to work here at this committee to ensure that it remains feasible and safe for our constituents back home by investing in this incredible energy source and its technology and making sure its value as carbon-free reliable baseload power is properly appreciated.

I believe that advanced nuclear is a key component of maintaining nuclear power in the future and will be an integral part of our energy portfolio here in the United States. My colleagues, Congressman Latta and McNerney's bill takes important steps in that direction.

I also want to applaud our colleague Mr. Kinzinger for his discussion draft. I think we share many similar concerns regarding the nuclear industry, and I am optimistic that we will be able to find some common ground on solutions. Though I couldn't help but notice the acronym for your bill is NUKEPA, which I find somewhat distressing.

But I am certainly encouraged by bringing attention to these issues the nuclear industry is facing, and I do hope we can work together on solutions and by coming up with a different acronym than the one you have chosen.

Thank you. I yield back.

Mr. WHITFIELD. The gentleman yields back. So that concludes the opening statements, and I am going to introduce the witnesses individually before they speak.

So first of all, we have Mr. Marvin Fertel, who I mentioned in my opening statement, president and chief executive officer for the Nuclear Energy Institute.

Thanks for being with us, and we look forward to your testimony. You are recognized for 5 minutes.

STATEMENTS OF MARVIN FERTEL, PRESIDENT AND CHIEF EXECUTIVE OFFICER, NUCLEAR ENERGY INSTITUTE; JEFFREY S. MERRIFIELD, PARTNER, PILLSBURY LAW FIRM, CHAIRMAN, ADVANCED REACTORS TASK FORCE, NUCLEAR INFRASTRUCTURE COUNCIL; TODD ALLEN, SENIOR FELLOW, CLEAN ENERGY PROGRAM, THIRD WAY; AND GEOFFREY FETTUS, SENIOR ATTORNEY, NATURAL RESOURCES DEFENSE COUNSEL

STATEMENT OF MARVIN FERTEL

Mr. FERTEL. Thank you, Mr. Chairman and Ranking Member Rush and members of the subcommittee. On behalf of the commercial nuclear energy industry, I want to thank the committee for considering the Advanced Nuclear Technology Development Act, H.R. 4979, and the discussion draft of the Nuclear Utilization of Keynote Energy Policies Act.

I am pleased to represent the broad nuclear industry, including the owners and operators of nuclear power plants and the supplier community today.

As Congressman Kinzinger said, nuclear energy is the largest and most efficient source of carbon-free electricity in the United States. Our 99 reactors produce nearly 20 percent of our Nation's electricity and approximately 63 percent of our carbon-free electricity.

Nuclear energy facilities demonstrate unmatched reliability by operating with an average capacity factor of 92 percent, higher than all other electricity sources. And importantly, they are essential to the country's economy and the communities in which they operate.

Despite the significant environmental, economic, and national security benefits that nuclear energy provides, the current regulatory requirements and licensing processes challenge the industry's ability to build new technologically advanced reactors.

The prospect of developing advanced reactors has become both attractive and necessary in the U.S. and abroad. In this country, approximately 126,000 megawatts of generation will be retired over the next 15 years. The U.S. Energy Information Administration forecasts the need for 287,000 megawatts of new electric capacity by 2040 in addition to the electric capacity that will be needed to replace the retired power plants.

Many other countries are looking to a rapid expansion of nuclear energy to address their growing electricity and environmental needs. Advanced nuclear reactor designs offer many technological advances for the U.S. and are also well suited to developing economies. However, without strong Federal leadership and direction,

the U.S. industry runs the risk of falling behind its international competitors.

H.R. 4979 affirms Congress' commitment to U.S. leadership in nuclear technology and safety. The industry supports provisions in the bill that effectively direct the NRC to think differently about licensing reactors. The bill calls for an efficient, risk-informed, technology-neutral framework for advanced reactor licensing and a phased review process that could effectively facilitate private financing for advanced reactors.

Developers will be able to demonstrate progress to investors and other participants in these first-of-a-kind projects and obtain necessary capital investments as they achieve milestones.

The NRC imposes stringent safety requirements that all nuclear facilities must meet to maintain public health and safety. As we look to the details of how innovative advanced reactor technologies can meet these requirements, it is important for the NRC's regulatory framework to acknowledge that there will be a variety of effective ways to meet their safety requirements.

H.R. 4979 also recognized that it is a government function to develop the regulatory infrastructure to licensed advanced reactor technologies and therefore authorizes Federal funding to support those activities.

Congress should reform the NRC's fee-recovery structure to make fees more equitable and transparent. Despite NRC's efforts to reduce its budget and rightsize the agency, fees continue to be excessive and limitations of the mandated 90 percent fee rule create fundamental structural problems.

The NRC budget is approximately \$1 billion per year, despite significant declines in its workload. In particular, according to an Ernst & Young study performed for the NRC, the NRC spends 37 percent of its budget on mission support costs, more than 10 percent higher than some peer agencies.

Because the NRC must collect 90 percent of its budget from licensees and the NRC budget has not correspondingly declined, remaining licensees are responsible for paying higher annual fees. With recent premature shutdowns and additional reactor decommissionings in the coming years, the current fee structure virtually guarantees that remaining licensees will continue to bear even higher annual fees.

The draft Nuclear Utilization of Keynote Energy Policies Act adopts a straightforward approach to making NRC fees more equitable. It would continue to require the licensee to pay for all agency activities attributable to a licensee or class of licensees but disallow collection of fees associated with the agency's corporate support. While there are Federal budget questions that arise with this approach, it would require the NRC to justify corporate support costs to Congress in order to receive appropriations, and in turn, prompt the NRC to control its budget and reduce or eliminate wasteful spending.

The draft bill recognizes the value of allowing international investments in U.S. nuclear plants by removing outdated restrictions on foreign ownership that ignore the multiple protections to our Nation's security and the reality of today's global nuclear energy markets. The draft bill also eliminates the uncontested mandatory

NRC hearing on construction permits and combined license applications. This would not limit public participation since the public does not participate in a mandatory hearing and multiple other formal opportunities are available for public participation.

The draft bill would require that the NRC improve the regulatory framework for decommissioning nuclear power reactors. It is in the best interests of all parties, the NRC, licensees, and other stakeholders, to have a more efficient regulatory framework for plants entering the decommissioning process. The existing framework does not appropriately account for the significant reduction in risk that results when a power reactor ceases operations, defuels, and decommissions.

In closing, on behalf of NEI and its members, I wish to thank Congressmen Latta and McNerney for introducing the important advanced reactor legislation. We support passage of this bill. We also appreciate Congressman Kinzinger's work to reform NRC fees and the regulatory process.

We look forward to working with members of the committee and their staff to advance these reforms. Again, thank you for the opportunity to testify today.

[The prepared statement of Mr. Fertel follows:]

**Testimony for the Record
Marvin S. Fertel
President and Chief Executive Officer
Nuclear Energy Institute
Before the
House Energy and Commerce Committee
April 29, 2016**

The Nuclear Energy Institute (NEI), on behalf of the commercial nuclear industry, appreciates the opportunity to provide testimony on H.R. 4979, the Advanced Nuclear Technology Development Act of 2016, introduced by Mr. Latta and Mr. McNerney. We also offer our views on the discussion draft of the Nuclear Utilization of Keynote Energy Policies Act.

I am Marvin S. Fertel, president and chief executive officer of the Nuclear Energy Institute. NEI is responsible for establishing unified industry policy on regulatory, financial, technical and legislative issues affecting the commercial nuclear energy industry. NEI has more than 350 members, including all U.S. companies licensed to operate commercial nuclear power plants, nuclear plant designers, major architect/engineering firms, fuel cycle facilities, materials licensees, labor organizations, universities, and other organizations involved in the nuclear energy sector.

I am pleased to represent the owners and operators of nuclear power plants, as nuclear energy is the largest and most efficient source of carbon-free electricity in the United States. Ninety-nine reactors produce nearly 20 percent of our nation's electricity and approximately 63 percent of our carbon-free electricity. Nuclear energy facilities demonstrate unmatched reliability by operating with an average capacity factor of 91.9 percent—higher than all other electricity

sources. Nuclear energy facilities are essential to the country's economy and communities in which they operate. The typical nuclear power plant generates \$470 million each year in the sale of goods and services in the local community, and employs between 500 and 700 workers. Looking to the future, an additional five reactors are under construction in the United States. While under construction, a new nuclear plant project creates up to 3,500 jobs at peak periods.

Notwithstanding the significant environmental, economic and national security benefits that nuclear energy generation provides, the current regulatory requirements and licensing processes challenge the industry's ability to build new, technologically advanced reactors. As such, we wish to express our appreciation to this Committee for its effort to prompt the NRC to accelerate its preparation for licensing advanced reactor technologies. More specifically, NEI supports an all-of-the-above future that includes subsequent license renewal of existing reactors, advanced large light water reactors (LWRs), small modular light water reactors (SMRs), and advanced non-light water reactors. We support Congress' direction to the NRC to modernize its regulatory framework to accommodate a range of innovative nuclear technologies and to offer a phased licensing process as an option to relieve developers of the need to obtain billions of dollars in capital early in the licensing process.

We also believe this Committee should consider three issues: reforming the NRC's fee recovery structure; increasing regulatory efficiencies to minimize licensing delays; and creating a more efficient regulatory framework for nuclear plants entering the decommissioning process. We appreciate Congressman Kinzinger's effort to address these important issues in the draft Nuclear Utilization of Keynote Energy Policies Act.

Congressional action is necessary if the United States is to maintain its leadership role in nuclear technology and safety.

The prospect of developing advanced reactors has become attractive in the U.S. and abroad. In this country, approximately 126 gigawatts of generation will be retired over the next 15 years. Given our country's commitment to meet clean air goals and the forecasts for future electricity demand, advanced reactor designs must be commercially available by the early 2030s. Even with the less than 1 percent projected annual growth in electricity demand, the U.S. Energy Information Administration forecasts a need for 287 gigawatts of *new* electric capacity by 2040 in the U.S. That is in addition to the electric capacity that will be needed to replace retired power plants.

Focusing only on the domestic need for additional electricity in the coming decades would overlook the likelihood of a significant increase in electricity demand worldwide. Many other countries are looking to a rapid expansion of nuclear energy to address their growing electricity needs, making it imperative that U.S. nuclear technology be available for international development. Advanced nuclear reactor designs offer many technological advantages (*e.g.*, reactor cooling even in the absence of an external energy supply; operation at or near atmospheric pressure, which reduces the likelihood of a rapid loss of coolant; and consumption of nuclear waste as fuel, reducing disposal issues). These attributes make advanced reactors particularly appropriate for placement in developing economies. However, without strong federal leadership and direction, the U.S. industry runs the risk of falling behind its international competitors, as other countries have substantial, state-funded advanced reactor technology

programs.

The Advanced Nuclear Technology Development Act affirms Congress' commitment to retaining U.S. leadership in nuclear technology and safety. Enactment of the bill would advance Congress' and the industry's vision in the following important ways:

1. The bill directs NRC and DOE to enter into a memorandum of understanding to ensure DOE has sufficient technical expertise to support timely development and commercial deployment of advanced reactor technologies and the NRC has sufficient technical expertise to support licensing. Additionally, DOE is directed to maintain and make available to the NRC facilities to support the commercial industry's development of these technologies.
2. The bill requires DOE to report to Congress on the status of its activities to facilitate testing and demonstration of advanced reactors on DOE land and at DOE facilities. DOE would also be required to report on the use of private land for testing and demonstration of advanced reactor designs.
3. The bill directs the NRC to establish a plan "for developing an efficient, risk informed, technology-neutral framework for advanced reactor licensing." The plan should include an evaluation of the unique aspects of advanced reactor licensing, regulatory framework options for licensing, and means of streamlining regulatory processes to minimize the time from application submittal to final approval. The plan also is to consider NRC use of "phased review processes," through which the NRC could conditionally approve early

design information, and submittals containing design criteria that would support a later phase of the design review.

4. The bill requires the NRC to seek input from DOE and stakeholders as it develops the plan for advanced reactor licensing and to include in the plan cost estimates, budgets, and milestones that must be achieved to implement an advanced reactor regulatory framework by 2019.
5. The bill recognizes that it is a government function to develop the regulatory infrastructure to license advanced reactor technologies and, therefore, authorizes federal funding to support those activities.

A requirement for the NRC to implement the option of a phased license review process will allow developers and advanced reactor license applicants to demonstrate to investors and other project participants that they are making progress toward eventual licensing of these first-of-a-kind projects. The phased approach will allow financing to be coordinated with achievement of each milestone, which significantly improves the funding paradigm for advanced reactor projects. Perceptions regarding regulatory risk already are impeding new reactor development in the U.S. and prompting technology companies to pursue their projects overseas. The ability to successfully complete specific licensing milestones should reduce broader concerns about regulatory uncertainty.

We commend Congress for mandating that the NRC and DOE support the use of federal facilities

and, potentially, private land to test advanced reactor designs. Successful testing is important to provide credible proof that the technology is sound, can be used for the intended application, and can be economically competitive.

It is timely to direct the NRC to modernize its regulatory framework to accommodate advanced reactor technologies and to increase the use of risk-informed, performance-based licensing techniques as it does so. The NRC imposes stringent safety requirements that all nuclear facilities must meet to maintain public health and safety. As we look to the details of how innovative advanced reactor technologies can meet these requirements, it is important for the NRC regulatory framework to acknowledge that there will be a variety of effective ways to achieve the desired performance.

Congress should reform the NRC's fee recovery structure to make fees more equitable and transparent.

The Omnibus Budget Reconciliation Act of 1990, as amended (OBRA-90), requires the NRC to recover approximately 90 percent of its budget through fees charged to licensees and applicants.¹ The fees are accounted for in two categories: "fees-for-services," which are currently charged at \$268 per hour, and annual fees, which are fees apportioned among licensee classes to cover the remainder of the agency's budget.

For the past several years, the industry has expressed its increasing concern regarding NRC's

¹ This fee-recovery requirement excludes amounts appropriated for waste incidental to reprocessing, generic homeland security activities, and inspector general services for the Defense Nuclear Facilities Safety Board, as well as any amounts appropriated from the Nuclear Waste Fund.

annual budget, which has been in the range of \$1 billion for more a decade. The budget has remained at this level despite the fact that the agency's workload has decreased. In turn, industry fees have become excessive. We recognize the NRC's Project Aim is intended to right-size the agency and refocus its work on priority matters. We note that this effort has made some progress to achieve these goals (*e.g.*, reductions in staff and budget, and prioritizing work on generic issues and rulemakings). Despite the agency's commendable efforts, these reductions are not sufficient and the industry continues to see regulatory inefficiencies.

The following problems illustrate the pressing need for Congress to take action to ensure that the regulatory process and costs do not limit the potential benefits that current and future nuclear energy technologies can provide.

- The NRC's overhead costs remain excessive and higher than peer agencies. In April 2015, Ernst and Young provided the NRC with an Overhead Assessment Report. Ernst and Young found that the NRC spends 37 percent of its budget on mission support costs.² The NRC's peer agencies spend only 20, 25, and 32 percent of their total budgets on mission support. Ernst and Young also found that "[w]ith the exceptions of FY 2015 and FY 2016, NRC's mission support costs as a percentage of total outlays have increased year-over-year for the last decade." To help roll back this decade-long increase in overhead costs, appropriators in Congress limited the portion of the NRC's FY 2016 budget allocated to corporate support (which constitutes the bulk of NRC's mission support costs) to roughly one-third (34 percent) of the agency's total budget. The NRC recently indicated in its FY 2017 budget

² As listed in the report, mission support includes corporate support (acquisitions, administrative services, financial management, human resources, information management, information technology, international activities, outreach, policy support, training, and travel) and office support (acquisitions, administrative services, financial management, human resources management, information management, information technology, support staff, training, and travel).

justification that it would remain below this cap in FY 2016, spending about 32 percent of its budget on corporate support. Notwithstanding this recent effort to limit the longstanding increases in corporate support costs, the NRC's FY 2017 budget would *increase* corporate support spending both in real dollars (an additional \$3.3 million) and as percent of the agency's total budget (bringing it to 33 percent). This proposed increase is especially troubling because the NRC's FY 2017 request removed more than \$23 million from the corporate support category. In other words, the NRC simply "realigned" (*i.e.*, re-categorized) certain activities that previously would have been listed as corporate support.

- A reduction in the number of licensees increases the fee burden on the remaining licensees.

The number of operating reactors and materials licensees has declined in recent years. Because the NRC must collect 90 percent of its budget from licensees and the NRC's budget has not correspondingly declined, remaining licensees are responsible for paying higher annual fees. With several recent premature power reactor shutdowns—and additional reactors planning or considering decommissioning in the coming years—the current fee structure virtually guarantees that remaining licensees will continue to bear even higher annual fees. Materials licensees face an even more significant problem. With more than 86 percent of all material licensees now under Agreement State jurisdiction, the remaining 14 percent of NRC material licensees are left to fund an extremely disproportionate share of the NRC's generic materials program. For example, when the number of uranium recovery facilities dropped from 12 to nine for FY 2016, the NRC proposed an 11 percent increase in the annual fee for the remaining licensees. This situation will worsen when seven NRC licensees become part of the developing Wyoming Agreement State program.

- The costs of licensing actions have unnecessarily increased over time. The costs of licensing actions continue to increase well beyond cost-of-living increases. For example, since 2000 the NRC review fees for operating reactor license renewals have increased annually at a rate of almost 17 percent despite the agency's extensive experience with the review process. This represents an *eight-fold increase* in review costs for license renewals rather than the decrease that would be expected in subsequent renewal applications. Similarly disturbing increases have occurred with new reactor licensing as early site permit review fees have increased at an annual rate of 15 percent since 2007. Worse, these increases often are accompanied by extended delays in the completion of the licensing actions and add to the NRC's licensing backlog.
- The industry pays for unjustified generic activities. Despite Congress' direction in the FY 2016 Consolidated Appropriations Act to include in the NRC's budget submittal all planned rulemakings, it is unclear how many rulemakings remain on the NRC's docket and how much the NRC plans to spend on each one. Although the NRC's report to the House and Senate Appropriations Committees on January 15, 2016, listed 43 proposed rules pending before the Commission, the NRC's 2015-2016 Rulemaking Activity Plan included prioritization results for 93 rulemakings. Of these 93 rulemakings, the NRC ranked only nine a LOW priority, meaning 84 rulemakings were ranked a MEDIUM or HIGH priority. A February 22, 2016 Commission letter to the House and Senate Appropriations Committees attempted to clarify this discrepancy by providing another list with 89 rulemakings: 55 proposed rules in development or published for public comments or final rules under

Commission consideration; 12 rulemakings identified for possible termination; and 22 petitions for rulemaking pending before the agency. Putting aside the lack of transparency associated with how the agency counts “active” rulemakings, the fact remains that the NRC should not be pursuing 50-plus rulemakings after more than 60 years of intensive regulation of an industry that operates at the highest levels of safety and reliability. This level of activity suggests that the NRC is pursuing rulemakings that are unlikely to be necessary to accomplish its public health, safety and security mission.

- The NRC budget and fee processes are not transparent. The industry pays for other generic activities (*e.g.*, international activities) not covered by the 10 percent fee-relief offset. Because the breakdown of fee recoverable items and fee relief is not discernable from agency documents, it is effectively impossible for the industry to determine the extent to which it pays for activities that are not attributable to and do not benefit a class of NRC licensees. For example, a comparison between the NRC’s congressional budget justification and the FY 2016 proposed fee rule indicates that the NRC will spend \$23.2 million for international activities but will only credit licensees with \$12.6 million in so-called fee relief. The NRC provided no explanation for why licensees should be assessed fees to pay for the remaining \$10.6 million. Unquestionably, NRC engagement in the international arena advances U.S. foreign policy objectives, but it also is the case that those efforts provide no direct benefit to the regulated community.

The draft Nuclear Utilization of Keynote Energy Policies Act adopts a straightforward approach to making NRC fees more equitable. It would continue to require the industry to pay for all

agency activity attributable to a licensee or a class of licensees but disallow collection of fees associated with the agency's corporate support. This approach would require the NRC to justify corporate support costs to Congress in order to receive appropriations and, in turn, prompt the NRC to control its budget and reduce or eliminate wasteful spending. While there are larger federal budget questions that arise with regard to the proposed need to increase net NRC appropriations, this approach, like that reflected in the Senate legislation, seeks to address the problem that members of Congress and industry have identified. The draft bill's proposal is eminently fair to the regulated community, which has no ability to require the NRC to exercise fiscal responsibility or ensure accountability.

Notably, however, the proposal retains licensee funding for rulemakings and other generic activities. As such, we suggest that the draft bill include a provision to minimize the industry's obligation to pay for generic activities unless their cost is disclosed and they are justified based on their contribution to safety. Thus, the NRC should be required to expressly identify in its budget request to Congress the anticipated expenditures for each rulemaking and for other generic activities. Offering a clear picture of what the NRC intends to spend on specific matters would significantly improve accountability and transparency.

Direction to streamline NRC regulatory processes will increase the agency's efficiency and focus on matters of safety significance.

It is important to reduce regulatory inefficiency to avoid unnecessarily extending the time required to obtain a license or otherwise receive an NRC approval. License renewal proceedings

that previously took two years to complete now may take five or more years. Some new nuclear plant applications have been pending before the NRC for more than six years. The legislation would add efficiency to the licensing process in several ways.

1. The draft bill recognizes the value of allowing international investment in U.S. nuclear plants. Foreign ownership, control or domination limitations in the Atomic Energy Act (sections 103d. and 104d.) are a relic of the 1950s. These outdated restrictions ignore the realities of today's global nuclear energy market. The Comptroller General, in consultation with the Secretary of Energy, is to submit a report to Congress on the feasibility and implications of repealing this restriction. We would expect the report to conclude that the foreign ownership, control or domination limitation unduly restricts investment in otherwise worthy projects and ultimately adds no value to nuclear safety or the protection of national security.

2. The draft bill eliminates the uncontested "mandatory" NRC hearing on construction permit and combined license applications. The mandatory hearing is an artifact of early licensing proceedings and no longer serves a useful purpose. Today, members of the public can request a hearing, access extensive information about a license application on the NRC's website, attend the numerous public meetings the NRC holds in their community, and submit comments to the NRC through its environmental review process. The NRC's Advisory Committee on Reactor Safety also provides an independent safety review of reactor license applications. As the public does not participate in a mandatory hearing, its elimination will have no impact on the public's opportunity to participate in the licensing process.

3. The draft bill clarifies that the NRC may use informal APA-sanctioned procedures when conducting hearings under section 189 of the Atomic Energy Act unless the Commission determines that formal proceedings are necessary to develop a sufficient record or achieve fairness. This clarification will eliminate previously-litigated questions regarding the legality of the NRC's hearing procedures.
4. The draft bill would help to ensure that NRC hearings on inspections, tests, analyses and acceptance criteria (ITAAC) for new reactors do not unduly delay the startup of the new plants. While the Commission has recently approved hearing procedures that attempt to minimize the potential for unnecessary delay, Congress should set more aggressive hearing deadlines, mandate the use of streamlined informal hearing procedures and ensure that a future Commission does not narrowly construe its authority to authorize interim operations while conducting an ITAAC hearing.
5. The draft bill recognizes the delay experienced by NRC applicants and directs the agency to streamline its license application review process to achieve milestones by specified deadlines. Since 2011, the NRC has, on average, nearly doubled the time it takes to review license renewal and power uprate applications. The draft bill requires the NRC to develop streamlined procedures that will eliminate its licensing backlog.
6. The draft bill would require that the NRC improve the regulatory framework for decommissioning nuclear power reactors. Because many regulations applicable to operating

reactors do not recognize the reduction in risk as facilities defuel and advance through the decommissioning process, reactors being decommissioned must either comply with requirements that were developed for operating reactors or request relief from those requirements through the exemption or license amendment process. While the NRC has already taken an initial step by issuing an advanced notice of proposed rulemaking on decommissioning, a more efficient regulatory framework for plants entering the decommissioning process is needed to address the fact that the existing regulatory framework does not appropriately account for the reduction in risk that results when a power reactor ceases operation, defuels and decommissions.

Conclusion

In closing, on behalf of NEI and its members, I wish to thank Congressmen Latta and McNerney for introducing important advanced reactor legislation. We support passage of this bill, which will provide environmental and economic benefits to all Americans by setting the stage for the development of innovative commercial reactor technologies and helping to retain the energy source responsible for 63 percent of the nation's carbon-free electricity. We also appreciate Congressman Kinzinger's work to reform NRC fees and the regulatory process and look forward to working with members of Congress to advance these reforms.

Mr. WHITFIELD. And our next witness is Mr. Jeffrey Merrifield, who is partner of the Pillsbury Law Firm and also chairman of the Advanced Reactors Task Force, the Nuclear Infrastructure Council. Welcome, and you are recognized for 5 minutes, Mr. Merrifield.

STATEMENT OF JEFFREY S. MERRIFIELD

Mr. MERRIFIELD. Thank you very much, Mr. Chairman. I also want to thank Ranking Member Rush and members of the subcommittee. As a former commissioner of the U.S. Nuclear Regulatory Commission, I frequently testified before this committee, and it is again an honor to—

Mr. WHITFIELD. Mr. Merrifield, would you move your microphone a little closer?

Mr. MERRIFIELD. Sorry. I got it.

Mr. Chairman, again, thank you very much.

Thank you, Ranking Member Rush.

As a former member and former commissioner of the Nuclear Regulatory Commission, I frequently testified before this committee, and again, it is an honor to be here this morning.

Today, I am appearing in my role as chair of the U.S. Nuclear Infrastructure Council, Advanced Reactors Task Force, although, as mentioned, I am a partner in the Pillsbury Law Firm. My testimony will discuss the provisions in H.R. 4979 on advanced reactors, as well as the proposed changes to the NRC procedures that are the subject of a discussion draft offered by Congressman Kinzinger.

NIC salutes the subcommittee's focus and support for advanced reactors, as well as the NRC budget reform provisions that provide funding for the NRC to develop a modernized nuclear licensing framework for advanced nuclear technologies. NIC issued a framework for advanced reactor licensing modernization white paper on February 22, 2016, which embraces many of the elements contained in the legislation.

When I first became a commissioner in 1998, the NRC, with the support of Congress, worked to rightsize the agency, consistent with the level of licensing and inspection activities. At that time, the agency had approximately 3,400 employees, and within the next few years we were able to reduce that down to about 2,800, principally through attrition, yet without any sacrifice to its mission of protecting people and the environment.

Today, the agency faces the same challenges to reduce its staff and to become more efficient and timely in its licensing activities. While the NRC has made great strides in rightsizing the agency through Project AIM, we believe further efficiencies can be realized, while at the same time maintaining safety and inspection activities and improving the timeliness of licensing.

During the past decade, the U.S. has maintained its technology leadership by developing new passive Generation III reactors in Georgia and South Carolina, as well as small modular light-water nuclear reactors headed toward deployment. NIC has seen significant growth and support for Generation IV advanced reactors that will provide expanded options for economical, carbon-free electricity and industrial heat generation.

If the United States is to be successful in maintaining its lead in developing and deploying these reactors in the 2020s and 2030s, Congress must consider significant policy changes. We believe the language in section 6 of H.R. 4979 will allow the agency to create a modern, risk-informed, technology-neutral framework, which will enable the development of appropriate advanced reactor regulations without passing these costs on to the developers or the utilities.

While section 6(a)(6) calls for the NRC to evaluate options to allow applicants to use phased review processes, we believe the language should be strengthened to require the NRC to establish specific stages in the commercial advanced nuclear reactor licensing process, including a precertification vendor design review modeled after the Canadian Nuclear Safety Commission vendor design process that was recommended by the NIC white paper.

Such a process would allow advanced reactor developers and investors to have a clearer picture of where they stand in the NRC process and in meeting NRC safety requirements and allow them to achieve further investment in their technologies.

We would emphasize a need to establish risk-informed performance criteria applicable for advanced reactors. While licensing process reforms are needed, advanced reactor technical performance criteria are critically required for developers to proceed with advanced reactor designs, and the NRC must move forward to finalize advanced generic design criteria, source term, and emergency planning requirements, among others.

We strongly support section 2 of the discussion draft which places fair and equitable provisions on the agency's fee-based programs. By eliminating the current fee-based-to-nonfee-based ratio and articulating the specific areas that will be borne by general revenues, the draft provides the appropriate balance between the fees borne by individual companies and those overhead activities covered by the Federal Government.

NIC believes the discussion draft would be strengthened by providing that the early stage engagement between advanced reactor developers and the NRC should be conducted at no or limited cost, with an appropriate cost share, perhaps 50/50 for later stages of the licensing process. While this can be funded through general revenues or a DOE grant program, either way, it should avoid the DOE and NRC picking advanced reactor winners and losers. We believe the private sector is better placed to identify and promote innovation, and the NRC licensing fees should not have a chilling effect on these entrepreneurial efforts.

Finally, I strongly support the elimination of the foreign ownership requirements of section 3 and the mandatory hearing requirements contained in section 4, and I am pleased to discuss my views with the subcommittee.

I would ask that some additional letters of support, including that of X-energy, be included in the hearing record.

And with that, I again thank you very much for allowing me to testify today.

[The prepared statement of Mr. Merrifield follows:]

UNITED STATES NUCLEAR
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**U.S. House of Representatives' Subcommittee on Energy and Power
Hearing on Enabling Advanced Reactors and a Legislative Hearing on
"H.R. 4979, the Advanced Nuclear Technology Development Act of 2016 and
H.R. ____, Nuclear Utilization of Keynote Energy Policies Act"**

**The Honorable Jeffrey S. Merrifield Commissioner, U.S. Nuclear Regulatory Commission
(1998-2007)
Partner, Pillsbury Winthrop Shaw Pittman &
Chairman, USNIC Advanced Reactors Task Force
April 29, 2016**

Chairman Whitfield, Ranking Member Rush and members of the Subcommittee, it is indeed a pleasure to testify before a Committee that I had the opportunity to testify before on many occasions during the time I served as a Commissioner of the U.S. Nuclear Regulatory Commission (NRC). I am appearing here today in my role as Chairman of the U.S. Nuclear Infrastructure Council (NIC) Advanced Reactors Task Force, although my full time occupation is as a Partner in the nuclear energy practice group of Pillsbury Law Firm.

Before I begin my testimony, I want to make it clear that, while I am testifying on behalf of NIC, the consensus views I am presenting do not necessarily reflect the specific opinions of all of the members of NIC, nor those of the law firm on which I am a partner. Further, I would provide the disclaimer that our firm represents a diversity of nuclear suppliers and utilities, and I personally serve as outside counsel for two Advanced Reactor developers.

Today, my testimony will reflect on the Agency at which I had the pleasure of serving, the provisions in H.R. 4979 on Advanced Reactors as well as the changes to the NRC procedures that are the subject of the discussion draft offered by Congressman Kinzinger. NIC salutes the Subcommittee's focus and support for Advanced Reactors included in H.R. 4979 as well as the NRC budget reform provisions in Section 7 that provide funding for the Agency to develop a modernized nuclear licensing framework for advanced nuclear technologies. For its part, NIC issued a Framework for Advanced Reactor Licensing Modernization White Paper on February 22, 2016, which embraces many of the elements contained in H.R. 4979 as they relate to Advanced Reactors. There are a few additional areas that the bills did not address, which we believe would further strengthen the legislation. While I will outline these areas later in my testimony, I wish to assure the Subcommittee we stand committed to work with the Committee and its staff to move forward expeditiously with H.R. 4979 as well as Congressman Adam Kinzinger's discussion draft.

Status of Advanced Reactors

Over the last several years, NIC has framed a confluence of environmental, energy security and competitiveness considerations that are accelerating the need for the expedited development of Advanced Nuclear Reactors in the United States and worldwide. These Advanced Reactors can be used globally to provide economical, carbon-free electricity and industrial heat generation, while providing a new option for the looming replacement of America's nuclear energy fleet as existing nuclear reactors reach the end of their licensing life beginning as early as 2030.

Ranging widely in size from micro-reactors of a few megawatts electric (MWe) to large gigawatt ("GW") -size reactors of 1000 MWe, these non-light water Advanced Reactors embrace enhanced passive safety features as well as the prospect for improved nuclear energy economics and competitiveness with other energy sources including natural gas for baseload supply. These Advanced Reactors also bring with them significant interest from the financial community, which is seeking gateway technologies to invest in this arena. In addition to funding and infrastructure, a modern licensing framework is needed to enable development and deployment of Advanced Reactor technology in the U.S. and to extend U.S. nuclear energy technology leadership that has featured progressive light water reactor designs including passive Generation III+ designs currently being deployed in Georgia and South Carolina as well as small, modular, light water nuclear reactors now headed toward deployment.

U.S. Nuclear Energy in Context

Today, U.S. nuclear energy plants provide almost 20 percent of the nation's electricity and over 60 percent of America's carbon emissions-free electricity. The U.S. fleet is comprised of 99 units that are based and adapted on light-water reactor ("LWR") technology directly developed by the U.S. Navy propulsion program. Utilities and the nuclear industry have improved upon and optimized the LWR technology and the current fleet is now operating at world-class high levels of safety and reliability. The U.S. fleet turned in another record setting year of operating performance in 2015, achieving a fleet-wide capacity factor of 91.9 percent.

However, the existing U.S. nuclear energy fleet is among the oldest in the world with over a third of the current plants being over 40 years old. Many of the reactors could be retired beginning around the 2030 timeframe, although there is a strong basis for extending their life to 80 years through a second license renewal.

With the worldwide impetus to reduce global carbon emissions – along with a significant increase in electricity demand – the U.S. has a compelling need to develop and deploy the next generation of Advanced Reactors. Deployment of this new generation of reactors will require a new model, one that is more dynamic and capable of forming private-public partnerships in support of private-sector-led innovation driven initially by private-sector investment. Already in the U.S., there are a number of Advanced Reactors that have progressed to the design and engineering stage and are supported by meaningful investments from the private sector.

While there is wide recognition regarding global climate change and the vital role that nuclear energy plays in meeting carbon reduction targets, the current level of government investment in nuclear technologies is markedly insufficient. According to the Energy Information Agency, with tax incentives, the U.S. government “spent” over \$15 billion on renewable and biomass programs in 2015 – but “spent” \$1.66 billion for nuclear energy in the same period.

Additionally, the current framework of U.S. government policy, legislation, regulation, research and development support, and fee-based licensing is more aligned with the past than what is needed for the future to commercialize a new generation of Advanced Reactors.

This is particularly true of the NRC licensing process, which presents one of the largest risk factors confronting private developers of Advanced Reactors. It does not easily accommodate a staged investment approach as the technology development and licensing risks are addressed and resolved.

Revitalizing the U.S. Advanced Reactor Development Mission

Currently, the DOE and NRC share responsibilities for supporting and overseeing the U.S. nuclear energy program under the Atomic Energy Act (“AEA”) and the Energy Reorganization Act (“ERA”). This latter Congressional Act assigned the promotional and development responsibilities to the U.S. Department of Energy (DOE – the successor agency to the Energy Research and Development Agency (“ERDA”). A companion agency, the NRC, was assigned the responsibilities for assuring public health and safety and carrying out the regulatory and licensing program.

Over the course of time, DOE increasingly focused on basic and applied research, while the NRC moved to focus exclusively on its primary mission of safety oversight and regulation. Today, this framework is struggling to foster the private capital formation required to advance promising private-sector nuclear innovation, as Advanced Reactor development companies are isolated from the types of direct government support that has been offered historically and, in a contemporary setting, support that is offered to other innovative but non-nuclear energy technology companies.

If the U.S. is to be successful in developing and deploying a new Advanced Reactor fleet in the late 2020s and early 2030s, Congress should consider significant policy changes. It should provide additional resources to both agencies as well as direct them to focus and mobilize their resources and expertise on the goal of expanding nuclear energy options with Advanced Reactors.

Both the DOE and NRC must be proactive in developing their capabilities and engaging with the Advanced Reactor community. Today, the NRC interprets its mission as an exclusive safety mission with a caveat that that its processes and activities must not place an undue burden on the industry. Accordingly, the NRC typically awaits applications and only reviews design certification applications that are full and complete. While the NRC has long recognized that

its paramount goal is to ensure public health and safety, the ERA also requires that the Agency enable the use of nuclear technologies for safe, beneficial uses. The unique features being trail blazed by Advanced Reactors justify an updated and modernized non-light water reactor design criteria as well as a NRC design review and licensing process which is consistent with H.R. 4979.

Congress should reinforce and support the NRC's efforts to enable the use of Advanced Reactors by setting appropriate deadlines for establishing non- light water reactor design criteria, design reviews and licensing activities, engaging in appropriate oversight of the NRC's review of these technologies and providing sufficient funding to allow the agency to execute accordingly.

Advanced Reactor Regulatory Capabilities

The NRC currently lacks sufficient capabilities for the licensing of non-light water reactors. In order to develop the appropriate regulatory basis to regulate Advanced Reactors, the NRC needs to better understand how these technologies work, how they can be regulated and how unnecessary regulatory conservatism can be avoided in the setting the design criteria of these advanced non-light water reactor designs. Because of the current funding formula wherein the NRC must recover 90 percent of its costs through fees, the resources for these activities must be borne principally by U.S. nuclear utilities – which are understandably concerned about the regulatory burden currently faced by the U.S. nuclear energy fleet in a highly competitive marketplace. Given that Advanced Reactor companies primarily rely on private funding, this NRC funding paradigm poses an extremely difficult challenge for this new industry's design advancement.

We believe the language in Section 6 of H.R. 4979 will allow the Agency to conduct the activities needed to create a modern, risk informed, technology neutral framework which will enable the development of appropriate Advanced Reactor Regulations, without passing these regulatory development costs to the existing utilities or the Advanced Reactor developers who are not in a position to bear these costs. We believe this change is consistent with the approach proposed in the NIC Framework for Advanced Reactor Licensing Modernization White Paper issued in February.

A Graduated Licensing Model Congruent with Graduated Private Capital Commitment

In order to align with the staged private investment model of step-wise investment based on project de-risking, NIC believes that H.R. 4979 should be strengthened by requiring the NRC to develop a specific pre-licensing conceptual design review process for the review of Advanced Reactor designs similar to that developed by the Canadian Nuclear Safety Commission ("CNSC").

The CNSC process is robust and graduated. It requires vendors to reach discrete milestones that allow investors to assess the technology's licensability and identify any potentially significant issues. It features an upfront Vendor Design Review to provide an early regulatory signal on the licensing feasibility of potential designs for less than \$5 million (US).

The early phases of this program would provide interim indications to allow the investment community to understand the licensability of the design without having to wait until the end of the licensing process, which can take eight to ten years. The current NRC process lacks transparency in cost and time, requiring potentially hundreds of millions in dollars of up-front investment while strongly discouraging private capital commitment.

A graduated process has the potential to enhance the ability of Advanced Reactor designers to attract vital sources of capital because it allows them to build confidence along the way that the design has the potential to be licensed. In order to foster a new generation of Advanced Reactor technologies, this is precisely the type of phased design review and licensing process that needs to be adopted by the NRC.

While Section 6(a)(6) calls for the NRC to evaluate "options to allow applicants to use phased review processes", we believe the language should be strengthened to require the NRC to establish specific stages in the commercial Advanced Nuclear Reactor licensing process, including a pre-licensing design review that was recommended in the NIC White Paper. A clear articulation by the Commission about the areas where specific designs do and do not need additional work would enable Advanced Reactor developers and investors to have a clearer picture of where they stand in the NRC process and in meeting NRC safety requirements. In turn, this would give greater transparency about the licensability, or lack of licensability of a given design, and would provide more efficient use of Agency and developer resources.

Finally, while we support the licensing reforms undertaken in Section 6, we would emphasize the importance of the NRC in establishing risk-informed, performance criteria applicable for Advanced Reactors. While licensing process reforms are needed, Advanced Reactor technical performance criteria are critically required for developers to proceed with designs. To assist this effort, the NRC needs to finalize advanced generic design criteria, source term, emergency planning requirements, etc.

NRC Fee Policies and Overhead

When I first became a Commissioner in 1998, the Agency, much as is the case today, was hearing calls that a number of nuclear reactors may shut down in the near future and Congress was "encouraging" the Agency to reduce the size of its budget and staff. Through the oversight efforts of this Committee and its Senate counterparts, the NRC was encouraged to work diligently to "right size" its staff consistent with the NRC's mission of protecting people and the environment while also increasing the efficiency of inspection and licensing activities. In 1998, the Agency had approximately 3,400 employees and within the next few years we were able to reduce that down to about 2,800 – principally through attrition.

As we know, in the early 2000s the size of the NRC began to expand, and with the subsequent events of September 11 and Fukushima, the Agency has not had the opportunity since the late 1990s to fully reassess the size of its staff or budget. I applaud the Agency for undertaking Project AIM and believe it will contribute to meaningful reductions in the size of the NRC.

That said, I understand and sympathize with the concerns previously voiced by members of this Committee regarding the size of the Agency, the decrease in efficiency of the Agency's licensing actions and a view that the overhead activities at the Agency have grown to a level which is not commensurate with the number of licensees currently under the purview of the NRC. As it relates to the size of the Agency, it is my view that this Committee is appropriately focused on further encouraging the NRC to "right size" its staffing below the level initially envisioned in Project AIM. Consistent with the activities taken by the Commission in the late 1990's, I believe that it is possible to appropriately reduce the size of the NRC, while at the same time, effectively maintaining safety, inspection activities and improving the timeliness of licensing actions.

We commend the Committee for continuing to encourage the Agency to focus on providing more timely and risk informed decision-making. Consistent with this focus, we support the provisions in Section 6 of Representative Kinzinger's discussion draft which would create specific timelines for the Agency to conduct environmental reviews, safety analysis reports and public licensing hearings. As a Commissioner, I led a task force that looked at many of these same issues, and I concur with the recommended changes that are included in the discussion draft.

Section 2 of the discussion draft, which is intended to place more fair and equitable provisions on the Agency's fee based programs, is an appropriate measure for the consideration of this Committee. As was the case when I appeared before this Committee over 15 years ago, I believe the amount of fees placed on individual licensees is not appropriate and should not cover inherent government functions and overhead. At that time, this Committee supported an increase in the ratio of fee based to non-fee based costs from 95/5 to the current level of 90/10. By eliminating the ratio, and articulating the specific areas that will be borne by general revenues, the discussion draft provides the appropriate balance between user fees, which should be borne by individual companies, and those overhead activities which are more appropriately covered by the federal government.

While the NRC is not a promoter of nuclear technologies, it is appropriate for the Commission to engage in early and enhanced communications and dialog with Advanced Reactor developers to allow new market entrants to fully understand what is needed to successfully prepare and undertake design review and licensing. Currently, the NRC has very limited dialog with Advanced Reactor technology developers, and when it does, it must charge hourly review fees (approximately \$270+ per hour/per NRC staff member) to these companies. As members of the Advanced Reactor community are early stage and entrepreneurially driven private companies, they lack the traditional resources to finance what can be very expensive regulatory fees.

NIC believes that the discussion draft would be strengthened by providing that the early stage engagement between an Advanced Reactor developer and the NRC should be conducted at no

or limited cost to the developer, with an appropriate cost share – perhaps 50/50 for latter stages of the licensing process. There are a variety of ways this could be funded, either through the use of general revenues or by creating a DOE grant program. However, whatever mechanism the Committee decides to utilize, it should be done in a way that avoids the DOE and NRC picking “winners and losers” within the Advanced Reactor community. In our view, the private sector, not a federal department or agency, is better placed to identify and promote innovation and the NRC licensing fees should not hinder these entrepreneurial efforts.

Further, and consistent with my earlier testimony, I believe that this Committee, and Congress, should review and reassess the amount of funding dedicated to nuclear energy research, development and deployment. Nationwide, we continue to invest huge sums of government funding toward renewable technologies. Given the enormous amounts of clean, carbon free energy provided by nuclear energy, Advanced Nuclear Reactor technologies deserve equal treatment at a minimum.

Finally, I would like to comment on a number of the other reforms that are included in Congressman Kinzinger’s discussion draft.

Section 3 – Foreign Ownership

First, as it relates to the study on elimination of Foreign Licensing Restrictions of Sections 103(d) and 104(d) of the Atomic Energy Act, I would recommend that Congress simply eliminate the foreign ownership requirement as an antiquated artifact of the Cold War. When I was on the Commission during the early 2000s, I and my colleagues testified in favor of the elimination of this provision as today we live in a world in which the United States is but one of 32 countries that operate civilian nuclear reactors.

Currently, Section 103(d) contains a two-part test, the first of which prohibits the issuance of a license to an individual or company that is “owned, controlled or dominated by an alien, a foreign corporation or a foreign government.” The second test allows the Commission to prohibit issuing a license if in its view, “the issuance of a license to such person would be inimical to the common defense and security or to the health and safety of the public.” In my view, as long as the second test is maintained, the blanket prohibition on foreign ownership is unnecessary, stifles innovation and is inconsistent with free trade.

Mandatory Hearings – Section 4

As mentioned previously, as an NRC Commissioner, I led a task force that looked at how to make the NRC new reactor licensing process more efficient. Among the recommendations that were included in this report was a proposal to eliminate the mandatory hearing requirements related to the issuance of power reactor licenses under Part 50 and Part 52. This was based on the view that when originally promulgated, Congress required mandatory hearings because in

the early days of the Atomic Energy Commission, the AEC approved several power reactors behind closed doors with virtually no notice or public input.

Today, with the subsequent requirements of the Administrative Procedure Act and the National Environmental Policy Act, combined with the very open and inclusive public process that has been established by the NRC, stakeholders have numerous and fulsome opportunities to comment on proposed new reactors. Additionally, with the contested hearing process available to concerned individuals and groups, legitimate and legally supported safety concerns will obtain a full public hearing under existing NRC procedures, notwithstanding the elimination of the mandatory hearing requirement. Finally, in order to prepare for the current mandatory hearing process, even if uncontested, the NRC staff and the Commission spend large amounts of time and money preparing for these proceedings – costs that are ultimately borne by licensees - with virtually nothing to be gained. For these reasons, I would recommend that this Committee repeal this antiquated provision.

Time to Make Dramatic and Significant Changes to Modernize and Spur Innovation

It is time to make dramatic and significant changes to reform the NRC as well as modernize the licensing process to spur innovation and enable Advanced Reactor technologies to achieve the full measure of their promise and the success that the nation needs to meet its future energy and environmental goals. This will require a sustained focus and investment of resources by the Federal government in support of private innovation and ingenuity. The return on investment will be crucial in ensuring that the U.S. maintains its technological leadership in nuclear energy so as to ensure and foster nuclear energy's contribution as a vital and carbon-free source of clean energy while providing jobs, economic competitiveness and energy security while improving our nation's environment and health.

Thank you very much for allowing me to testify today.

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The USNIC Advanced Reactors Task Force is a project of the U.S. Nuclear Infrastructure Council (www.usnic.org), the leading business consortium for new nuclear energy and promotion of the U.S. supply chain globally. The views above represent a consensus of the USNIC's Advanced Reactors Task Force and the Council, but do not necessarily represent the specific views of individual member companies and organizations.

Mr. WHITFIELD. Thank you, Mr. Merrifield.

Our next witness is Mr. Todd Allen, who is a senior fellow at the Clean Energy Program for the Third Way.

Dr. Allen, thanks for being with us, and you are recognized for 5 minutes, and please get the microphone up close. Thank you.

STATEMENT OF TODD ALLEN

Mr. ALLEN. Absolutely.

Good morning, Chairman Whitfield, Ranking Member Rush, other distinguished members of the subcommittee. On behalf of Third Way, I greatly appreciate the opportunity to provide testimony on the importance of nuclear energy innovation.

My perspective on nuclear energy comes from my diverse career. My first job after college, I lived on a floating nuclear reactor as an officer in the U.S. nuclear submarine fleet. I spent 10 years teaching at the University of Wisconsin nuclear engineering. I have seen firsthand the young generation that believes in nuclear technology as a critical component for providing clean energy.

I have worked in the national laboratory system as the deputy for science and technology at the Idaho National Laboratory, working to open up the laboratory facilities to university and industry users across the country. Now I am at think tank, where I think.

Third Way supports the further development of an innovation culture that creates and brings to market advanced nuclear technologies. Currently, nuclear energy is provided as a single product offering, specifically large gigawatt scale electricity production machines. But the national energy system is changing rapidly, opening up the possibility of nuclear energy supporting a wider range of functions if new ideas can get from conception to commercialization.

A 2015 Third Way report identified nearly 50 companies, backed by more than \$1.3 billion in private capital, developing plans for new nuclear plants in the U.S. and Canada. These companies are creating a growing number of product options of varying sizes and capabilities intending to build upon the continued success of our current light-water reactor fleet, which provides over 60 percent of the carbon-free electricity in the United States.

Private-public partnerships will be key to the story, similar to the way hydraulic fracking and the Internet were developed and how SpaceX is currently teaming with NASA to send unmanned vehicles to Mars.

So how can Federal investments nurture this emerging culture of nuclear innovation? I will use as an example a hypothetical graduate nuclear engineering student named Carla who wants to provide clean energy to the world and make money at the same time. What is her path to success in transitioning a good idea on paper to a marketable product and a thriving company, and where can partnerships with the Federal Government be useful?

First step, Carla would benefit from early interactions with technical experts, financiers, and business developers. We suggest Carla could be helped through the creation of private-public partnerships in early innovation, a proposal we have called Innovation Centers. Innovation Centers would also benefit the Department of Energy by providing the agency with valuable information on pri-

vate sector investment trends that could then inform how DOE directs research dollars to solve problems that support multiple companies.

Step two, securing investments. At the Innovation Center, Carla has opportunities to troubleshoot and mature her concept. She is also introduced to financial firms, which ultimately helps her secure a small investment to fund her company. Carla could leverage for private investment to receive DOE cost share, allowing her to move quickly and to signal to investors that her design is especially promising. The Department of Energy already engages in cost share programs, like the ones currently supporting project agreements with Southern Company's TerraPower and X-energy, and further use of these is encouraged.

Her third step, specialized testing. Here is where the Federal programs become uniquely valuable, through access to national test beds. Some development requires access to specialized capabilities. For instance, test reactors, facilities to test radioactive materials, or high-performance computing. Fortunately, a number of the Department of Energy laboratories have these types of facilities and expertise that Carla needs. The Department of Energy created the Gateway for Accelerated Innovation in Nuclear, or GAIN program, to facilitate these private-public interactions.

Step four, beginning her regulatory process. As she develops her technology, Carla would like to get signals from the regulator, short of licensing, that her technical solutions are reasonable. This will help her gain additional funding increments as she develops her designs. She needs a regulator who is staffed and funded in a manner that allows it to be ready to respond to emerging light-water reactor technologies. Ideally, the pace of regulatory review would support new products for an energy system that is changing rapidly, all while maintaining the traditional exemplary safety record.

Step five, demonstration reactor. As is typical with many new and capital-intensive technologies, Carla may need to build a demonstration of a reactor before moving on to a full-scale commercial reactor. To address this, the Department of Energy should allow innovators like Carla a chance to build their demonstrations at one of their laboratories that already have experience running nuclear facilities, allowing Carla to build her reactor at Idaho or Oak Ridge, for example, to help her more affordably test her design and make any final changes to commercialize her product.

Final step, NRC licensing of her demonstration reactor. Because Carla is hoping her demonstration reactor design will eventually be commercialized, which would require her to go through the NRC licensing process, it would benefit her if the NRC were involved in the licensing and construction of her demonstration reactor. When Carla's demonstration reactor works, she is ready to work with her investors and the Nuclear Regulatory Commission to get final design approval and funding for commercialization.

Where can Congress help? Early innovation. Support the creation of multiple private-public Innovation Centers that facilitate the creation of a new generation of nuclear entrepreneurs. This can be formally done through report language in the appropriations process.

Test beds. Support the GAIN program as our national nuclear Innovation Center, ensuring a modern infrastructure with world-leading staff that serves as the Nation's test bed. Ensure that federally supported R&D programs are structured to maximize value through well-structured private-public partnerships. And finally, regulation. Ensure that the Nuclear Regulatory Commission is staffed, structured, and funded to support a pace of regulatory review that would support new products for an energy system that is changing rapidly.

House Resolution 4979 asks the NRC and DOE to look broadly at their functions and report back on how they could better serve this emerging nuclear innovation community. We are supportive of this national approach and have suggested some specific ideas. We hope DOE and NRC have additional useful ideas.

We also appreciate the intent of the discussion draft from Mr. Kinzinger and are ready and willing to interact to optimize our ability to move nuclear technology forward.

Thank you for inviting me to testify. I look forward to your questions.

[The prepared statement of Mr. Allen follows:]

**Written Testimony to U.S. House of Representatives Committee
on Energy and Commerce**

Witness Name: Todd R. Allen, Senior Fellow

Witness Organization: Third Way

Name and Date of Hearing: April 29, 2016

**Subcommittee of Jurisdiction: Subcommittee on Energy and Power
21st Century Nuclear Energy Innovation**

Major Points

- Third Way supports the further development of the emerging innovation culture that creates and brings to market new advanced nuclear technologies. Well-structured Federal investments and programs can nurture this culture
- What specifically is needed in policy? The language of the Advanced Nuclear Technology Development Act and the intent of the Nuclear Utilization of Keynote Energy Policies Act are positive steps toward creating a more efficient regulatory review process that better reflects the needs of today's energy system. Bipartisan legislation with similar goals has been introduced in the Senate, indicating broad interest and opportunity for Congress to act. The Department of Energy has created the Gateway for Accelerated Innovation in Nuclear (GAIN) program to make the national laboratories more effective partners with the innovation community. Congress should encourage rapid steps from DOE to make GAIN more nimble. ARPA-E is studying the possibility of an advanced fission energy project. Congress should encourage ARPA-E to create this first program in fission. Finally, to ensure that we have a continued stream of new ideas flowing from the researchers, Congress should encourage DOE to fund Innovation Centers as described in a recent Third Way report, co-written with the Idaho National Laboratory. These private-public partnerships in early innovation will allow for greater creativity from our universities and laboratories, focused through interactions with private industry.

Summary

Third Way supports the further development of an innovation culture that creates and brings to market new advanced nuclear technologies. Developing these new technologies is critically important in meeting our ambitious emissions goals. A 2015 Third Way report identified nearly 50 companies, backed by more than \$1.3 billion in private capital, developing plans for new nuclear plants in the U.S. and Canada. These companies are creating a growing number of product options of varying sizes and capabilities, intending to build upon the continued success of our current light water reactor fleet, which provides approximately 60% of the carbon-free electricity in the U.S.

How can Federal investments nurture this emerging culture of nuclear innovation? They should encourage a young professional to believe that entrepreneurship in nuclear technology is possible and desired; encourage private-public partnerships in early innovation, generating many ideas, only a fraction of which make their way to commercialization; provide test beds that allow for specialized testing and when needed, demonstration; and promote the sale of advanced technologies internationally. This does require strong federal programs, consistent with private-public partnerships that have previously developed technologies that led to major societal changes such as hydraulic fracking and the internet.

How could DOE research programs stimulate innovation and private investment? They could answer broad technology questions of value to multiple companies, to partner with industry in

early innovation, and to serve as the national test bed for specialized testing and demonstration/deployment. They would want interagency support to compete in global markets.

How could an improved regulatory process stimulate innovation and private investment?

Innovators need regulatory signals as the technology becomes more mature. These signals are short of licensing decisions, but are necessary to convince an investment community to place ever-larger bets on a new technology. The regulator needs to maintain staff trained to evaluate concepts that differ from our current light water-cooled reactors and the regulator needs to be funded in a manner that provides flexibility for staff to engage with emerging technologies. Ideally, the pace of regulatory review would support new products for an energy system that is changing rapidly, all while maintaining the traditional exemplary safety record.

What then specifically is needed in policy? The language of the Advanced Nuclear Technology Development Act and the intent of the Nuclear Utilization of Keynote Energy Policies Act are positive steps toward creating a more efficient regulatory review process that better reflects the needs of today's energy system. Bipartisan legislation with similar goals has been introduced in the Senate, indicating broad interest and opportunity for Congress to act. The Department of Energy has created the Gateway for Accelerated Innovation in Nuclear program to make the national laboratories more effective partners with the innovation community. Congress should encourage rapid steps from DOE to make GAIN more nimble. ARPA-E is studying the possibility of an advanced fission energy project. Congress should encourage ARPA-E to create this first program in fission. Finally, to ensure that we have a continued stream of new ideas flowing from the researchers, Congress should encourage DOE to fund Innovation Centers as

described in a recent Third Way report, co-written with the GAIN leadership at the Idaho National Laboratory. These private-public partnerships in early innovation will allow for greater creativity from our universities and laboratories, focused through interactions with private industry.

Detailed Testimony

Energy Use and Nuclear Technology

The world will continue to rely on energy to provide the things that we depend upon for a civil society to function. These functions include water purification, sanitation, irrigation, heating and air conditioning, vaccinations, pharmaceuticals, and our homes.

Examining, over a time period from about 1850 to the present, the way humans use energy shows a natural tendency to use fuels that emit less carbon into the atmosphere. We naturally do that.

This change has taken us from brown coal and firewood to black coal to crude oil, and in recent years, to a strong use of natural gas as our most used energy source. This change in the fuels we use correlates with the energy density of the fuel. We tend to gravitate towards fuels that provide more energy from a fixed amount of fuel. This allows newer power plants to be smaller. Additionally, using less fuel then leaves untouched more of nature and thus is a better way to both provide energy to meet human needs, while also limiting the effects on biodiversity.

The foundation for powering a modern society in a clean manner rests on three components. First, we will likely continue to use our available fossil resources but in ways that have less

impact on the environment. For instance, the trend towards more natural gas will continue but we will also look to advance technologies like carbon capture and storage to mitigate any negative aspects of fossil fuel usage. We will increasingly use more variable renewable resources like solar and wind, but they are unlikely to support all aspects of a clean, robust, and affordable modern energy system. Finally, our future will be strongly supported by nuclear energy as nuclear fuel provides a much larger amount of energy for a given amount of fuel than even natural gas while emitting no carbon dioxide.

Two of these three pathways require “big technology” like carbon capture and storage and nuclear. A review of major shifts in technology use shows a strong history of private-public partnerships in developing “big technology”. Examples include hydraulic fracking and the internet. Private-public partnerships have always been an important driver for nuclear technology development and this is true also for the 21st century.

While the focus of this testimony is on moving advanced nuclear technologies to market, it should be noted that our current deregulated markets for electricity do not focus decisions more than a few years beyond today and do not place value on the “big technologies” we will need for a robust, dependable, and clean energy future. We do need to provide some focus soon on how our current market structures discourage long-range planning in energy production.

The Current State of Nuclear Technology

To deploy a nuclear energy technology requires a Nuclear Regulatory Commission (NRC) license. Currently we have one modern U.S. nuclear technology licensed and being built, the Westinghouse AP1000 light water reactor. We have a single water-cooled small modular reactor, the NuScale Integral Pressurized Water Reactor, working through the regulatory process, and we have no advanced reactors actively working to move towards an NRC license. Having a single available option is reminiscent of stories of the Soviet Union, where the one vegetable choice was cabbage. Not satisfying.

Over the past few years, a growing number of privately funded companies have initiated the development of advanced nuclear concepts. A Third Way report released in May of 2015 identified nearly 50 companies, backed by more than \$1.3 billion in private capital, developing plans for new nuclear plants in the U.S. and Canada. The mix includes startups with a few employees to well-known investors like Bill Gates, all placing bets on a nuclear comeback, hoping to get the technology in position to win in an increasingly energy hungry, carbon-limited world.

Within this group of companies, we see a growing number of product options of varying sizes and capabilities. These companies are thinking about all of the production, transmission, and distribution functions of modern energy delivery, and starting to imagine an increasing variety of sizes and function that could be supplied using nuclear technology.

Over the last year, in parallel with the technical work on advanced nuclear, the policy community has begun to discuss how to stimulate this burgeoning innovation culture in the nuclear technology community.

We applaud the Congress for the growing number of bills being introduced and the sophisticated discussion being held around appropriations on advanced nuclear technology. This testimony now sketches out a framework that shows what is needed by a company trying to bring a new nuclear technology to market and how these legislative initiatives, complimented by administration initiatives, are starting to align to support an innovation culture.

Establishing Policy to Encourage Innovation in Nuclear Technology

In simple terms, the overall structure of the Federal programs and policies should support taking an early innovative idea all the way to commercialization. They should encourage a young professional to believe that entrepreneurship in nuclear technology is possible and desired; encourage private-public partnerships in early innovation, generating many ideas, only a fraction of which make their way to commercialization; provide test beds that allow for specialized testing and when needed, demonstration; and promote the sale of advanced technologies internationally.

How then might the NRC and DOE work to support a culture that encourages innovation?

NRC engagement needs to occur as the technology advances and becomes more mature. Innovators need to get a sense of the regulatory response (short of licensing) as the technology becomes more mature. This is necessary to be able to convince an investment community to place ever-larger bets on a technology. The regulator needs to exercise a structure that allows it to maintain staff trained to evaluate concepts that differ from our current light water-cooled reactors. Finally, the regulator needs to be funded in a manner that provides flexibility for staff to engage with emerging technologies. In the big picture, we want to help the regulator transition to a pace of review that is appropriate for an energy delivery system that is changing rapidly & demands new products, all while maintaining their traditional exemplary safety record.

Recent reports from the Nuclear Innovation Alliance and Third Way provide suggestions as to how the interface between the regulator and the emerging industry could be improved and many of these ideas are captured in recent legislation arriving in both the House and Senate.

On the research component, the Department of Energy should structure programs to support many ideas in early innovation, a disciplined selection of a small number of the innovative ideas for further demonstration of feasibility, and selection of a small subset of these demonstrations for deployment. The Department should take strong signals from analysis of future energy needs combined with signals from private investment in establishing its R&D programs executed in the university and national laboratory programs.

The national R&D programs, funded by DOE, can answer broad technology questions of value to multiple companies, partner with industry in early innovation, as well serve as the national test bed for specialized testing and demonstration/deployment. These technology programs can be paralleled with new efforts to improve the communications and engagement around nuclear technology, to remedy communications and engagement mistakes made when nuclear technology was introduced in the 1950s and 1960s. These programs should boldly encourage an innovation community that looks to create new markets for nuclear technology and to be strongly engaged with the specialized or regional needs of various communities.

Some of these changes to R&D program structures are underway. Notably, the DOE announced the creation of the GAIN program to provide better access to the national laboratories by private industry. Recent reports from Third Way provide suggestions as to how to establish early innovation programs, and many of these ideas are captured in recent legislation arriving in both the House and Senate.

In summary, to take advantage of the benefits of nuclear technology requires strong private-public partnerships, led by private sector innovators. The Department of Energy research programs need to be thoughtfully crafted to support these relationships. The Nuclear Regulatory Commission needs to operate at a pace of review that is appropriate for an energy delivery system that is changing rapidly & demands new products, all while maintaining their traditional exemplary safety record.

Mr. WHITFIELD. Thank you.

And our next witness is Mr. Geoffrey Fettus, who is the senior attorney for the Natural Resources Defense Council.

Thanks for being with us, and you are recognized for 5 minutes.

STATEMENT OF GEOFFREY FETTUS

Mr. FETTUS. Thank you, Chairman Whitfield and Ranking Member Rush and distinguished members of the committee. It is a great honor to be here. I will just highlight a few points here.

First, with respect to H.R. 4979, which requires DOE and the NRC to work together to work to develop a plan with public input for advanced reactor licensing systems, such a charge has merit in that it asks two of the relevant Federal agencies to work together, but some cautions are in order.

Two hundred and seventy days is far too short a time to both gather and analyze the necessary technical and regulatory information and provide for public comment with respect to such a complicated set of economic, security, and environmental challenges as those faced by the licensing of advanced reactors.

Further, both EPA and the President's Council on Environmental Quality should be part of any such enterprise, EPA for its standard-setting authority and CEQ for its oversight of NEPA obligations. Even though many of these advanced reactor concepts have been around for decades, none of the current space have demonstrated the security, environmental, and safety improvements necessary to make them viable in the near term, and more pertinent to the reality of a carbon-constrained future, none of them have demonstrated any likelihood that they will be able to compete in competitive energy markets. And the licensing process, effectively designed by industry and streamlined by the NRC multiple times over the last two decades, has little to do with that.

Thus, our concern is real that the practical nuclear engineering and economic hurdles inherent to these technologies may serve as a distraction to the rapid continued scale-up of existing, economically viable, and proven solutions to the threat of climate change from wind, solar, and energy efficiencies.

Second, we found the discussion draft substantially more problematic, and I will highlight just a few of the sections.

Section 2 unwisely shifts substantial costs to the taxpayers rather than collecting them, as has been done historically via licensing fees.

Section 3 requires a study on the feasibility and implications of repealing foreign ownership restrictions. While it is wise to study a matter and collect information before legislating, we would urge a requirement for wide public input on a matter this complicated, especially from the security terms.

Section 4 does away with the mandatory hearing provision, which would do much harm to public confidence that all technical issues have been thoroughly and adequately considered by the NRC. Indeed, the mandatory hearing plays a crucial role in supplementing the contested hearing process in which few issues—and I want to stress this—sometimes no issues survive the gauntlet of NRC's arduous procedural requirement for admission of issues to a hearing.

The mandatory hearing process has a proven track record of highlighting weaknesses in the NRC's staff's review. For example, in the case of the Clinton ESP, the Atomic Safety and Licensing Board found the staff's review, and I quote, "did not supply adequate technical information or flow of logic to permit a judgment as to whether the staff had a reasonable basis for its conclusions," 64 NRC at 460.

Section 5 is equally troublesome as it is simply a codification of agency drift to an informal, less rigorous hearing process that really has already been underway for a long time. And rather than ensuring the hearing process continues to become a yet more expedient process and more of a restrictive venue for states and the public, Congress should be directing NRC to submit a substantially redesigned adjudicatory hearing process that will provide regulatory certainty but will also simplify the hearing requirements to allow substantive technical issues of safety or environmental concern come to the fore rather than entertaining joint industry-staff efforts to flyspeck, curtail, or have dismissed literally every contention that has ever been filed before the Atomic Safety and Licensing Board.

Section 6 is also problematic in that it weakens the opportunity for hearings on inspections, test analyses, and acceptance criteria prior to operation. It further bars the use of incomplete information as a basis for granting a hearing.

Briefly, the perception that hearings cause delays in licensing has no basis in fact. The industry has long structured the hearing process, and NRC staff requests for additional information are at the heart of the timing, and that is simply evidence of the regulator doing its job.

But even more to the point, docketing the application before it is complete when it often contains substantial areas that are promised to be addressed later or leaves out significant details creates the false impression that the time between when the application is docketed and when the final decision is rendered is attributable to the hearing process and public participation. This delay should not be used to justify even further restrictions.

Section 7 would do grave harm to NEPA and likely bar any meaningful NEPA review by staff. The current NEPA process, as is practiced by the NRC, is already problematic, and I detail that in my testimony.

And finally, with respect to section 8, we recommend striking the text in section (b), "factors," entirely from the draft legislation as this language can prejudice and distort the final decommissioning rulemaking that has just commenced at the Commission.

Thank you again for this opportunity, and I am happy to take any questions.

[The prepared statement of Mr. Fettus follows:]

Statement of

Geoffrey H. Fettus
Senior Attorney
Natural Resources Defense Council, Inc.

**“H.R. 4979, the Advanced Nuclear Technology Development Act of 2016 and H.R. ____,
Nuclear Utilization of Keynote Energy Policies Act.”**

Before the

**Congress of the United States
House of Representatives
Committee on Energy and Commerce
Subcommittee on Energy and Power
2123 Rayburn House Office Building**



April 29, 2016

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Introduction

Mr. Chairman and members of the Subcommittee, thank you for providing the Natural Resources Defense Council, Inc. (NRDC) this opportunity to present our views on H.R. 4979, the Advanced Nuclear Technology Development Act of 2016 and H.R.____, Nuclear Utilization of Keynote Energy Policies Act.

NRDC is a national, non-profit organization of scientists, lawyers, and environmental specialists, dedicated to protecting public health and the environment. Founded in 1970, NRDC serves more than one million members, supporters and environmental activists with offices in New York, Washington, Los Angeles, San Francisco, Chicago, Bozeman, and Beijing. We have worked on nuclear safety and regulation issues since our founding, and we will continue to do so.

Summary of Testimony

As an initial matter, we address H.R. 4979, the Advanced Nuclear Technology Development Act of 2016 (“H.R. 4979”), and follow with discussion of its counterpart in this hearing, H.R.____, Nuclear Utilization of Keynote Energy Policies Act (“NUKEPA Discussion Draft”).

H.R. 4979

The pursuit of concepts for advanced nuclear reactors that burn a significant fraction of their radioactive waste, are highly difficult to use to make nuclear weapons, operate at higher temperatures for greater thermal efficiency, and are inherently far safer than today’s technologies, have been science and engineering goals for decades. But while there are several advanced nuclear technologies under development (many of them based on ideas that span the atomic age), none have demonstrated some or all of these traits in a working prototype. Moreover the practical nuclear engineering and economic hurdles inherent to these technologies are such that NRDC questions whether advanced nuclear can ever be transformative – or even shoulder a small fraction of our fast evolving energy markets as we address the pressing needs of climate change. Furthermore, as an environmental advocacy organization, NRDC has concerns that advanced nuclear may serve as a distraction to the rapid, continued scale-up of existing,

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economically viable and proven solutions to the threat of climate change from wind, solar and energy efficiency technologies.

H.R. 4979 requires that the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) work together to produce a plan “for developing an efficient, risk-informed, technology-neutral framework for advanced reactor licensing,” including public input, within 270 days after the date of enactment. Such a charge to DOE and NRC has merit in that it asks two of the relevant federal agencies to work together and report to the legislative branch on a potentially necessary set of future regulations. However, NRDC cautions that 270 days is far too short a time period for these two federal agencies to both gather and analyze the necessary technical and regulatory information, and provide it for public comment, with respect to such a complicated a set of problems as licensing advanced reactors will pose. Advanced reactors concepts by definition differ substantially in design and operation, including nuclear fuel cycle aspects, from the current licensed, operating fleet of light water reactors. The 270 day limit set in this draft legislation artificially limits NRC’s and DOE’s opportunity to get full and thorough feedback from States and the public, which NRDC views as crucial in this process.

Further, the bill casts its net of federal agencies too narrowly, as both the Environmental Protection Agency (EPA) and the President’s Council on Environmental Quality (CEQ) should be part of any such enterprise. EPA has standard setting authority for certain radioactive release limits, and CEQ’s authority pertains to oversight of National Environmental Policy Act (NEPA) obligations that will, for certain, loom large in any new licensing proceeding for advanced reactors. All of which takes us to our last caution, the timing of matters. In this matter the involved federal agencies must take their time in assessing the certain wide range of opinion on the appropriate regulatory scheme necessary to ensure the safety of any new potential license for an “advanced” reactor. This cannot be done adequately in the proposed timeframe.

A number of advanced reactor concepts involve reprocessing of spent nuclear fuel and direct use of plutonium in the civilian energy sector. Such advanced nuclear technologies present a heightened risk of proliferation and the threat of terrorist diversion of fissile material to construct

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an improvised nuclear device. NRDC notes an inconsistency in the language of HR4979 regarding nuclear weapons proliferation. In Sec. 2. FINDINGS., paragraph (4), the legislation states: “The United States commercial nuclear industry must continue to lead the international civilian nuclear marketplace, because it is one of our most powerful national security tools, guaranteeing the safe, secure and *exclusively peaceful* use of nuclear energy (emphasis added).” In Sec. 3. DEFINITIONS., paragraph (1), states: “The term “advanced reactor” means a nuclear fission reactor with significant design improvements over the most recent generation of nuclear reactors. Such improvements may include inherent safety features, lower waste yields, greater fuel utilization, superior reliability, *resistance to proliferation*, and increased thermal efficiency (emphasis added).” The threat of nuclear proliferation from civilian nuclear energy technologies can be managed but not eliminated. History holds valuable lessons where commercial nuclear energy exports have aided the spread of nuclear weapons to new countries. Whether or not civilian nuclear energy technology is used for exclusively peaceful purposes is not just a technological issue but also one of diplomacy, law and international relations.

NUKEPA Discussion Draft

The NUKEPA Discussion Draft is problematic in several areas. Our testimony addresses our concerns section by section below.

Section 2

Section 2, Fair and Equitable Funding, represents a shift of substantial cost burdens to the taxpayers. The section amends section 6101(c)(2) of the Omnibus Budget Reconciliation Act of 1990 (42 U.S.C. 2214(c)(2)) to revise the amount of annual charges collected from all licensees and certificate holders to equal 100 percent of the budget authority of the NRC for the fiscal year, less existing funding exemptions, infrastructure, and corporate support costs. The draft legislation is not clear as to the precise dollar amount that would no longer be recovered from industry but now be charged to taxpayers, but the amount could plausibly be substantial. For example, in the recent House Report of the Energy and Water Development Appropriations Bill, the appropriators recommended a further to from the FY 17 request of \$319,100,000 to \$305,456,000. *See*, Energy And Water Development Appropriations Bill for FY 17 Committee

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Report, 114–532, (April 26, 2016), 114th Congress, 2d Session, House Of Representatives, at 160.

The Report language was explicit on this point: “The recommendation establishes Corporate Support as a new control point. The funds provided for Corporate Support have been reduced by \$3,644,000 as a result of the savings identified in the rebaselining process and by \$10,000,000 to further accelerate the right-sizing of Corporate Support activities. While the Committee notes that the Commission has adopted many of the recommendations proposed by the independent review of corporate support requirements, more needs to be done to reduce corporate support costs.” *Id.* Thus, we note that this legislative language is being offered at a time when NRC is under significant pressure to reduce its budget expenditures, and such a provision, if it were to become law, would unwisely shift costs from the profiting industry to the taxpayers. We recommend rejecting this proposed section.

Section 3

Section 3 requires the Comptroller General, in consultation with DOE, to author a study for congressional review on the feasibility and implications of repealing restrictions under sections 103(d) and 104(d) of the Atomic Energy Act (AEA) on licensing of certain nuclear facility operations by foreign persons. We commend the Committee’s caution in this instance in asking for a study prior to attempting to legislate in this area, especially in a bill related to advanced reactors and the attendant security and proliferation concerns inherent to associated nuclear fuel cycles. Pursuant to that, we urge the section to require an opportunity for public input or comment on the draft or preliminary findings of such a study, as a wide-ranging set of perspectives on the matter can inform Congress whether and how it wishes to take the matter up in the future, if at all.

Section 4

Section 4 amends the AEA to eliminate the requirement to hold a public hearing for new plant construction applications while purportedly maintaining measures for affected parties to request the Commission hold a hearing. NRDC opposes this provision and this section should be

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discarded entirely. As our colleague Dr. Edward Lyman of the Union of Concerned Scientists noted in a Senate hearing last week on a similar provision in a Senate bill, “[m]andatory hearings provide an important independent review of uncontested issues addressed in new reactor license approvals and allow the Atomic Safety and Licensing Board (or the NRC commissioners themselves) to examine the adequacy of the NRC staff’s review of license applications. Diane Curran, a lawyer, has identified numerous examples from past mandatory hearings in which serious deficiencies in the NRC staff’s review were uncovered. These issues would not have come to light in the absence of mandatory hearings. This process helps to provide public confidence that all technical issues have been thoroughly and adequately considered by the NRC.” Testimony of Edwin Lyman, PhD Senior Scientist, Union of Concerned Scientists On “Enabling Advanced Reactors and a Legislative Hearing on S.2795, The Nuclear Energy Innovation and Modernization Act.” Before the Subcommittee on Clean Air and Nuclear Safety Committee on Environment and Public Works U.S. Senate April 21, 2016, at 12, *see*, http://www.epw.senate.gov/public/_cache/files/49c19c65-0886-46fc-afc7-b944ca7e2e7c/lyman-testimony.pdf.

Section 5

NRDC objects to this suggested provision. Section 5 weakens the statutory requirements in the AEA to allow for informal adjudicatory procedures established under the Administrative Procedures Act to meet requirements for hearings and judicial review. Unfortunately, this is simply a codification of agency drift to an informal, less rigorous hearing procedures process that has already been long underway.

Essentially, the public role of the AEA hearing provisions was established so that members of the public, including representatives of state, local, and tribal governments, can bring their concerns regarding compliance with the NRC’s statutory mandate and regulatory requirements into the Commission’s licensing and rulemaking processes, where these concerns could theoretically be fairly adjudicated. Along with this, unfortunately, there developed a firm (and unfounded) belief of nuclear power proponents that public involvement in the original nuclear

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power licensing process created under the AEA significantly hampered the industry and at least partially caused the subsidence of the first nuclear build-out.¹ So in starting in 1989 and for several years thereafter, the nuclear industry and the NRC worked together to reshape the licensing and public participation regulations more to their liking, setting up what seemed to be a greatly streamlined path to reactor deployment.²

In our judgment this hearing process, as it currently exists, is a stacked deck for any public intervenor or State seeking to wade into what is termed a “strict by design” process. NRDC detailed these difficulties to the Commission in 2013.³ And just so the Committee is clear on what the already burdensome hearing process requires for a State or the public, following the Notice of Opportunity for hearing in the Federal Register, a prospective petitioner who believes [s]he may have an affected interest in the proceeding has *only 60* days in which to: (1) study the voluminous license application and draft environmental report; (2) investigate any safety and/or environmental concerns they have identified in the report; (3) document his/her standing to pursue these concerns; (4) draft admissible safety and/or environmental contentions; (5) seek out technical declarations from experts to support these contentions, and (6) hire expert legal counsel to frame “with specificity” the contentions and their legal bases in ways that satisfy all the “strict-by design” pleading requirements of 10 CFR §2.309 (f).

NRDC advises that, rather than ensuring the hearing process continues to become yet more expedient for industry and more of a restricted venue for States and the public, Congress should be directing NRC to submit a substantially redesigned adjudicatory hearing process that

¹ See, Anthony Z. Roisman et al., *Regulating Nuclear Power in the New Millennium (The Role of the Public)*, 26 PACE ENVTL. L. REV. 317, 318–21 (2009), (explaining the constructive historical role played by public interveners in the nuclear licensing process).

² For a perspective of how this licensing reform was viewed in 2007, see Larry Parker & Mark Holt, Congressional Research Service, *Nuclear Power: Outlook For New U.S. Reactors*, at 3, 6 (2007), available at <https://fas.org/sgp/crs/misc/RL33442.pdf>. The NRC regulations governing reactor licensing can be found at 10 C.F.R. §§ 52.0–.303 (2016), available at <http://www.nrc.gov/reading-rm/doc-collections/cfr/part052/>.

³ See, Christopher Paine, Nuclear Program Director, Natural Resources Defense Council; *How NRC Rules Suppress Meaningful Public Participation In NRC Regulatory Decision-making*; Before the Nuclear Regulatory Commission Rockville, Maryland, January 31, 2013; found online at https://www.nrdc.org/sites/default/files/nuc_13020601a.pdf.

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simplifies the hearing requirements to for substantive, technical issues of safety or environmental concern come to fore rather than entertaining joint industry-Staff efforts to flyspeck, curtail or have dismissed literally every contention that has ever been filed before the Atomic Safety & Licensing Board. Such would new hearing process would (1) allow for more than one opportunity for intervention (for example, with release of the Draft Environmental Impact Statement along with the submission of the license application) and (2) a less administratively burdensome set of contention filing requirements (akin to Federal Civil Procedure “notice pleading”) to resolve onerous issues with demonstrated standing.

Section 6

NRDC objects to this provision. Section 6 amends the AEA to provide hearings on inspections, test, analyses, and acceptance criteria as accepted unless substantial evidence that one or more of the criteria have not been met and the operational consequences will not adequately provide for the protection of public health and safety. Section 6(b) further reduces the number of days for a request of a hearing for the Commission and increases the burden on any petitioner that might seek to intervene on safety by striking the current “prima facie” showing in favor “substantial evidence” and, most troublingly, inserting a clause that bars any intervenor claims over “incomplete information.”

As a first matter, this is a significant weakening of what was already a problematic reactor licensing process set up years ago. The former two-step licensing requirements—(1) approving construction of a specific safe reactor design at an environmentally suitable site, and (2) attesting to the readiness of the reactor as built to operate safely—were merged into a single combined Construction and Operating License (“COL”).⁴ The clear intent of these regulatory revisions, even according to the NRC, was to reduce the applicant’s risk of exposure to intervenor contentions that could lead to costly delays in starting up or completing a plant. *Id.* at 5.⁵ Both

⁴ U.S. Nuclear Regulatory Comm’n, Nuclear Plant Licensing Process 1, 3 (2005), available at <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/licensing-process-fs.pdf>, (hereinafter “Nuclear Fact Sheet”)

⁵ An application for a combined license under 10 CFR Part 52 (2016) can incorporate by reference a design certification and/or an early site permit. This approach allows for issues resolved during the design certification

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NRC staff and the licensee currently must agree in advance on the specific acceptance criteria for critical items that will later be verified by NRC inspectors as having been completed correctly as construction proceeds. Thus, opportunities for the public to raise concerns at this stage are already limited. According to the NRC, at unspecified periodic intervals during construction, it will publish “notices of these completions in the Federal Register. Then, not less than 180 days before the date scheduled for initial loading of fuel, the NRC will publish a notice of intended operation of the facility in the Federal Register. There is an opportunity for a hearing at this time, but the NRC will consider petitions for a hearing only if the petitioner demonstrates that the licensee has not met or will not meet the acceptance criteria.”⁶ But now, the NUKEPA Discussion Draft that is a subject of today’s hearing proposes taking this already limited, constrained process and making it even harder for a State or the public to provide what has been demonstrated to be an important role to improve nuclear safety.

The final clause in Section 6, barring “incomplete information” as a basis for granting a hearing is especially objectionable. The perception that hearings cause delays due to the number of hearing days or unfounded contentions is without basis.⁷ In fact, nuclear licensing applications and documents, while typically lengthy, in fact have been shown to be deficient in detail and noticeably lacking in the specifics on issues of greatest concern to the intervening public or state. This was detailed in a 2009 Law Review article by Anthony Roisman that describes the burdens on *NRC Staff and the public* incurred in this process:

The NRC Staff is also aware that the applications as filed and accepted for docketing are seriously deficient. It devotes months of its efforts to submitting requests for additional information (RAIs) to the applicant to complete the required details of the application. This iterative process is not, in and of itself, inappropriate and apparently reflects a serious commitment by the NRC Staff to

rulemaking and the early site permit hearing processes to be precluded from reconsideration later at the combined license stage.

⁶ Nuclear Fact Sheet at 1, 3.

⁷ See Roisman et al., *Regulating Nuclear Power* at 322-328 (2009), full cite at note 1.

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improve the quality of the information it must review to make safety determinations. However, docketing the application long before the application is complete, when it often contains substantial areas in which the applicant merely promises to address an issue at a later date or leaves out most of the significant details of its proposed actions, creates the false impression that the time between when the application is “docketed” and when a final decision is rendered is attributable to the hearing process and public participation. This “delay” is then used to justify even further restrictions on the public's right to participate.

Id. at 323 (citations omitted).

Section 7

NRDC objects to this provision. As with the problems identified in Section 6, it is our view that the problems and controversies created by Section 7 will prove extensive. Section 7 amends the AEA to establish draconian deadlines for the NRC to complete major license application milestones, including filing a draft environmental impact statement within one year, the technical review process and safety evaluation report within two years, and public licensing hearings within 30 months of the filing of the application. The section further weakens NEPA to allow for limit environmental impact statements to purely “supplemental” status (on the theory that it will be tiered to an “early site permit” – but that includes each and every reactor relicensing or licensing application) and based solely on new and significant information that would “materially change the prior findings or conclusions.” The section finally requires the Commission initiate a rulemaking in one year to amend the regulations and provides a (theoretical) severance clause that nothing in the subsection exempts the Commission from compliance with NEPA.

Make no mistake, this section would do grave harm to NEPA and likely bar any meaningful NEPA review by Staff and challenge by the public or an affected State. The current NEPA process as it is practiced by the NRC is already problematic and heavily slanted against the

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public and meaningful oversight. Adoption of this suggested provision would turn it into a mere fig leaf, if even that.

To put it into context for the Committee, the idea behind NEPA is that a federal agency must produce environmental impact statements on a timetable that allows the environmental considerations to be explored and commented upon by the public *and then considered* on a schedule that meaningfully informs agency decision-making with respect to the *proposed* action. CEQ rules prohibit *ex post facto* use of environmental impact statements to justify decisions already taken. So, this requires the agency to determine—early in the agency’s decision process and with public input—the appropriate scope of its required environmental analysis. After which, the agency prepares a draft statement for public comment outlining various reasonable alternatives for implementing its proposed action that would either prevent, reduce, or mitigate harmful environmental impacts, and identifying the agency’s preferred alternative, if it has one. Then typically at least 30 days prior to any formal “Record of Decision” to move forward with implementing the proposed action, the Agency must issue a final environmental impact statement that responds to the public comments received, and identifies any changes to the draft analysis or preferred alternative.

In NRDC’s judgment, NEPA doesn’t work as intended at the NRC and this draft provision would make matters – already untenable – worse. In contrast to other federal agencies – which guarantees to those who can show they might be harmed by an agency action predicated on a flawed NEPA analysis, the right to challenge it in federal district court – the NRC hurdles are substantially higher. NRDC’s Mr. Paine’s detailed to the Commission (cited at n. 3) how the Commission’s rules routinely deny this right of judicial review to any state or member of the public who has not previously gained party status at the outset of the licensing proceeding years before NRC has even issued the first draft NEPA document (and to gain party status the State or public must file at least one admissible contention based on a “genuine dispute” with the applicant’s environmental report on a “material issue of law or fact” in the truncated process described *infra* at 6).

And now, as this section suggests, to accomplish the entirety of a new reactor’s NEPA compliance in one bare year and to limit the public only to issues not raised (perhaps decades)

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before in the Early Site Permitting process is at best far-fetched, and would assuredly make the process nearly meaningless. Rather, Congress should be looking at strengthening hearing and NEPA requirements so that public and State trust in the industry and NRC can be restored. As a 30 year serving ASLB Judge wrote just a few years ago,

The Petitioners were instrumental in focusing the Board's attention on the troubling matters discussed above. That they did so is a testament to the contribution that they, and others like them, can make to a proceeding. Moreover, in doing so they often labor under a number of disadvantages.

In the Matter of Shaw Areva Mox Services (Mixed Oxide Fuel Fabrication Facility), LB-08-11, Docket No. 70-3098-MLA, at 49 (June 27, 2008) (Farrar, J., concurring).

Section 8

ection 8 of the NUKENA Discussion Draft is concerned with the matter of nuclear reactor decommissioning. We note that attention to reactor decommissioning by the NRC came late, after extensive nuclear power plant construction and operation in the United States. Currently the NRC has stated an objective of 2019 for completion of a rulemaking on reactor decommissioning, having issued an Advance Notice Of Proposed Rulemaking (ANPR), "Regulatory Improvements for Decommissioning Power Reactors" on November 19, 2015, and concluded this ANPR public comment period on March 18, 2016. NRC was candid in the ANPR that the agency "has never promulgated comprehensive regulations governing the decommissioning of nuclear power reactors." Decommissioning issues will likely grow in importance given recent, unplanned reactor retirements and the growing challenges for the U.S. nuclear industry related to aging, reliability and safety, and economic competitiveness. The NUKENA Discussion Draft requires the NRC to initiate the rulemaking proceeding within 90 days after then enactment, to be completed not later than 48 months after that date. NRDC cautions that the initiation of the rulemaking would allow the NRC roughly four months with which to consider public comment on the ANPR, which in our view is too short – at least six months should be allotted for Staff to analyze and respond to the information received during the

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public comment period from the ANPR. Indeed, we urge the Committee to solicit NRC's input on how much time is required. However, the four year requirement on a final rulemaking is consistent with the timetable proposed by the NRC.

NRDC recommends striking the text in (b) FACTORS entirely from the draft legislation, as this language can prejudice and distort the final rulemaking. During decommissioning a large radiological source term is still present. Spent fuel pool fires can occur due to a loss of pool water inventory caused by either accidents or terrorist attacks. The absolute probability of such an event cannot be known with certainty. The risk of zirconium fire from spent nuclear fuel stored onsite during decommissioning is a radiological risk that could have large impacts in terms of off-site radiological contamination. In general the risk of a radiological release from a decommissioning reactor is not just a factor of whether the reactor is generating electricity or not, but also impacted by facility maintenance, accident mitigation measures and security. In NRDC's comments on the NRC ANPR, we cautioned against any erosion of emergency planning, physical security requirements, fitness for duty requirements, or training requirements until the physical protection of dry cask storage creates a more robust barrier to release of fission products from spent nuclear fuel.

Thank you again for this opportunity and I am happy to answer any questions.

Mr. WHITFIELD. Well, thank you.

Thank all of you for your testimony.

At this time, we will recognize members for questions.

And, Mr. Latta, you are recognized for 5 minutes.

Mr. LATTA. Well, thanks, Mr. Chairman, and again, thanks for holding today's hearing.

And, gentlemen, thanks very much for your testimony today. It is very much appreciated.

Mr. Merrifield, if I could start with the first question to you.

My legislation requires the development of phased licensing process to provide certain assurances to the license applicants. What do you see are the primary advantages of structuring the licensing process in this manner and how would you recommend the NRC develop such a process?

Mr. MERRIFIELD. Well, I think right now one of the disadvantages of the current system is it is sort of all or nothing. You have to put in your license application and wait a very long period of time to determine whether the NRC is going to find that to be acceptable.

For the advanced reactor community, having a stepwise process, as envisioned by your bill, would allow early interaction with the NRC and an early indication of whether that design may be licensable. If, indeed, the NRC finds out that that is the case, that developer can identify additional areas of funding to continue to process that application and that design.

If for some reason—and we hope it is not the case—the NRC were to find that that would be something that would be difficult or not able to be licensed, then that applicant can then make a logical business decision whether they want to continue to move forward or not, and we think that is a real benefit to innovation.

Mr. LATTA. Well, thank you. And your testimony also suggests that the model used by the Canadian nuclear regulator should be pursued. What do you think makes their structure more unique and constructive?

Mr. MERRIFIELD. Well, it has some very specific steps to it. It does have this pre-application vendor design review. It has got some specific deliverables that are expected by the Canadian regulator that are well spelled out. It has a specific timing for when that review should occur. And, indeed, they even have limitations in terms of what the cost is going to be for the applicant.

So it makes it a very clear program for everyone involved to understand what is expected in that first step, and it allows the technology both to be evaluated as well as to move forward.

Mr. LATTA. Thank you.

Dr. Allen, if I could turn to you, following up on that, do you have any additional thoughts regarding the benefit of the phased licensing process.

Mr. ALLEN. Just one small thing. I agree with the commissioner that it is a very important early signal to someone who is trying to take an early idea to commercialization to be able to get that feedback from the regulator.

The other thing by getting those is, parallel to this, we have got the Department of Energy doing research programs in similar technical areas. The more that we can get early signals that we can

then use to feed back and guide how we spend Federal dollars on research in a way that helps those private companies is also very useful.

Mr. LATTA. Thank you.

If I could ask Mr. Fertel a question of you. In your testimony you talk about that the country is going to lose, in the next 15 years, 126 gigawatts of generation and that we are going to need 287 gigawatts by 2040. I represent a district with 60,000 manufacturing jobs. We have to have a baseload capacity out there.

Could you just maybe kind of give me an overview of how many power plants we are talking about when you are talking about 126 gigawatts and what we are going to need when you look at 287?

Mr. FERTEL. I think, Congressman, in general, you could think about them if they are gas plants, which is what we are building now, they are probably on the order of 400 to 500 megawatts each. So if we need 100,000 of them, we are going to be building 2,500-megawatt—I am sorry—1,000, yes, we would be building 100 of those, to get to 240 plus—it is almost 500,000 megawatts. So you would be building 1,000 plants at 500 megawatts each.

Mr. LATTA. Thank you.

Mr. Merrifield, the Advanced Nuclear Technology Development Act requires the NRC to develop a risk-informed regulatory framework. Given your experience as a commissioner, would you please provide your interpretation of what a risk-informed framework means and what the primary inputs are into such a framework?

Mr. MERRIFIELD. Well, a risk-informed performance-based approach uses a combination of risk analysis and performance history to identify what are the most significant areas to focus your inspection and your regulatory activities. It recognizes that in any system, whether it is a nuclear power plant, a petrochemical refinery, or an interplanetary space vehicle, every system is not equally important to safety. So using a risk-informed performance-based approach allows you to prioritize what are the most critical components and focus your regulatory process toward those.

Mr. LATTA. Well, thank you very much.

And, Mr. Chair, I see my time is about ready to expire, and I yield back.

Mr. WHITFIELD. The gentleman yields back.

At this time, I recognize the gentleman from Illinois, Mr. Rush for 5 minutes.

Mr. RUSH. I want to thank you, Mr. Chairman.

Mr. Fertel, last week at the NRC's fiscal year 2017 budget hearing, the subcommittee examined the agency's request of almost \$20 million less this year than what was enacted in last year's budget. These cuts were said to be in line with the agency's Project AIM initiative designed to streamline operations and better reflect the Commission's increased workload.

However, in your statement you said that those reductions are not sufficient and that industry continues to see regulatory inefficiencies. Can you discuss why the new fee structure, as outlined in the discussion draft, is necessary?

However, how would the change in the outline in the bill impact safety standards and protocols in these nuclear facilities.

And if there are any other witnesses who would like to address any of these questions that I have asked, please chime in.

Mr. Fertel.

Mr. FERTEL. Thank you for the question, Congressman.

First of all, we never want to see either NRC's effectiveness as a regulator or their credibility as a regulator undermined. We think they are the best regulator in the world, and it is very important to us, from a commercial industry standpoint, for them to be very effective and credible in what they do.

They have Project AIM going. We think Project AIM is a very significant and sincere effort on their part to look at rebaselining what they are doing. The scope of what they have as responsibilities has dramatically decreased. They had staffed up for 20-plus new plants. They were operating as though they had 107 existing reactors. We are moving forward with four new reactors. We currently have 99, and a number of those are going to be shutting down soon. Their material licensees have significantly decreased in how many that they are regulating.

So they have, and they recognize this, a significant opportunity to rebaseline what they are trying to do with the basic scope of safety that they have to look at.

They also, as the commissioner mentioned before, are looking at getting much more safety focused. They were looking at on the order of greater than 60 new rulemakings, which now the Commission is saying they are not going to do all of them, for an industry that is performing exceptionally well and for an industry that they have been regulating now for 50-plus years.

So we see a significant opportunity for them to continue to do what they are doing, and we think that as they do what the industry is doing, as you deal with turnover due to retirements, you deal with a lot of this through attrition. And basically, you have an opportunity to hire critical resources, but probably not replace all resources. That is what we are doing on our side really religiously right now, unfortunately, because of the challenges that our plants face.

On the corporate overhead and the approach in the bill that Congressman Kinzinger has proposed, what we see is really a tremendous benefit of having Congress provide some accountability and oversight to the corporate overhead. Their corporate overhead, based upon the study that they commissioned with Ernst & Young, is much higher than all their peer agencies that they looked at.

I don't think they are evil for doing that, but there is not a lot of accountability for them to do less because we pay for it. It is not appropriated money, there is not a lot of oversight put to it, and there is very little transparency from our side to seeing what we are paying for and why.

So we see a significant opportunity. But to your point, we do not want to hurt their credibility or their effectiveness, but we think that they can continue going down their path. Now, we may push harder because we know they won't go as fast, but we think that that helps them go in the right direction.

Mr. MERRIFIELD. Congressman, to that point, I mean, I was very proud to serve as a commissioner of the NRC, and I agree with the

characterization. It contains an extraordinary group of hard-dedicated individuals.

Having said that, as I related in my testimony, we went through a similar process when I was a commissioner to the process that they are undergoing today. There was a decreasing workload, and there was a need to appropriately align the size of the workforce and the task and make it more risk informed.

We were able to do that, and I think it resulted from a couple of things. One, we had a significant amount of oversight from Congress. We had to provide monthly reports to Congress on the progress of the licensing activities that we had underway. And that drove the Commission, in its budget process, in what it presented to Congress, to conduct a line-by-line review of how it was spending money, what the priorities were, and to make sure that it was doing the most important stuff and recognize that some things just simply didn't need to be done. I think the Commission certainly needs to have that level of engagement, and I trust they should right now.

The one thing I would mention on corporate overhead support—we didn't have this term when I was a commissioner—I think there has been a lot of growth in things like IT and other things which may drive some of this. There is one program I think this committee needs to be aware is important that isn't overhead, and that is international programs. There are countries around the world that look to the NRC to help them craft their regulatory programs. It is very important, as Congress looks to oversee these programs, that that one, in particular, is not hurt.

Those are important investments, they should come from general revenues, but it is assistance that that agency provides around the world, and it is critical.

Mr. FERTEL. The industry would certainly support what Commissioner Merrifield recommends on them helping internationally from a safety standpoint.

Mr. RUSH. I yield back, Mr. Chairman.

Mr. WHITFIELD. At this time, I recognize the gentleman from West Virginia for 5 minutes, Mr. McKinley.

Mr. MCKINLEY. Thank you, Mr. Chairman. And in deference to time, I will try to keep this short, so I am going limit to maybe one or two questions on it.

Mr. Fertel, with you with the NEI, we understand with the new nuclear technologies that will come as a result of legislation like this, we know that there are going to be developments that will probably reduce the amount of waste product that comes from the spent fuel rods. But nevertheless the whole process of making nuclear energy is going to develop a waste product, maybe less than we are currently doing, but nevertheless there still will be a waste product.

So does NEI have a position? Do you support the Yucca Mountain as a permanent site for the disposal of nuclear fuel waste as required by law?

Mr. FERTEL. Congressman, we have always supported going forward, finishing the licensing on Yucca Mountain to determine it is licensed, which we think it would be, and then to move forward with Yucca Mountain. We also support, in parallel, the necessity of

having centralized interim storage, because we don't think you can get to Yucca and do everything fast enough for the fact that we have plants that are shutting down. And our support also goes to making sure that there is access to the Nuclear Waste Fund. There is over \$30 billion in it, and we don't have access right now.

Mr. MCKINLEY. Of the 99, I guess, reactors we have functioning, I am curious about what is being done currently to safeguard those spent fuel rods in those water baths. We know the potential with all the fear of terrorism and other activity for national security. Is there something being done on this nuclear waste management that can give us a greater comfort than the way we are doing it now? If we are not using Yucca Mountain yet, how safe should we feel?

Mr. FERTEL. Yes. I am sure Commissioner Merrifield will add to this.

Mr. MERRIFIELD. I will.

Mr. FERTEL. But the NRC heavily regulates what we do with used nuclear fuel, both while it is in the spent fuel pool and then when we put it in dry cast storage on site. We obviously have stringent security plans to make sure that not just the used fuel is protected, but the active fuel and other things at our plants. And based upon the Fukushima lessons learned, there has even been enhancements to what we do with used fuel at our sites because of what we learned from what went on in Japan.

So I think to some degree the problem with used fuel is that it is managed very well on sites, which doesn't create the crisis to cause our country to try and implement the Nuclear Waste Policy Act or any other law related to it. So the good news is we manage it very well and it is regulated very well. The bad news is it doesn't move it very quickly to where you want it to go.

Mr. MCKINLEY. Thank you.

Mr. MERRIFIELD. Congressman, on the issue of security, I was a commissioner during 9/11. I was in front of this committee talking about the things that needed to be accomplished to protect the U.S. fleet of nuclear units.

I can say without reservation, I have been on nuclear sites within the last week looking at security issues, and I can assure you these are the safest industrial facilities in the United States. The level of security that we have at the nuclear power plants in the United States is well beyond what is even needed to protect that fuel from the adversaries that we face today.

Mr. MCKINLEY. Thank you.

And, Chairman, I yield back the balance of my time.

Mr. WHITFIELD. We have two votes on the floor. We have got about 10 or 11 minutes left. So if you all would be in agreement, we will recognize you for 3 minutes, and we will just get as far as we can, and then if somebody wants to come back, we can talk about that.

So, Mr. McNerney, you are recognized for 3 minutes.

Mr. MCNERNEY. Thank you, Mr. Chairman.

Mr. Fertel, do you believe that we need to include fusion specifically in the H.R. 4979 framework?

Mr. FERTEL. Was the question about fusion?

Mr. MCNERNEY. Yes.

Mr. FERTEL. To be honest, I hadn't thought about that, but my reaction is I think it is a whole different regulatory regime that we would have to look at for fusion, and the availability of fusion is still far enough off that I wouldn't rush it in and distract the NRC from paying attention to being able to put a regulatory process in place for the other technologies that are deployable sooner than that. I wouldn't eliminate it as something you should look at for the longer term, Congressman.

Mr. MCNERNEY. OK. Thank you.

Mr. Allen, the Third Way report that identified 50 companies developing plans for new nuclear plants in the U.S. and Canada, how soon are some of these technologies going to be available and is the NRC ready for that?

Mr. ALLEN. I think they are on a big spectrum, depending on how much technology development has been done in the past. I would say the quickest, assuming that we do the types of things we need in the regulatory space, would be on the order of 10 to 15 years. Some of them are much further out than that.

And I think that the NRC has a strong regulatory function, but as we talked about, it could do some things to be better receptive to these types of companies and to build staff depth in areas that they are not used to regulating.

Mr. MCNERNEY. Mr. Merrifield, do you think there is a risk of agencies blocking heads against each other, the NRC and the DOE, with respect to the new technology?

Mr. MERRIFIELD. There were a lot of discussions between the DOE and NRC on earlier advanced reactor-like programs. That did not get as far as I think we had hoped it would have gotten. I think with the focus that this committee and your counterparts in the Senate have on advanced reactor technologies, the legislation that you have before you will give the framework and the encouragement for the NRC to move forward.

They are an agency which, when focused on a mission, do a great job of accomplishing it. I sometimes refer to them as the Boy Scouts of Federal agencies. They need the focus, they need the encouragement of this committee. But I think they can accomplish the mission to appropriately and safely license and regulate advanced reactors in a timely and effective way.

Mr. MCNERNEY. And an MOU would be sufficient to cause that to happen?

Mr. MERRIFIELD. I believe so, yes, Congressman.

Mr. MCNERNEY. Thank you.

Mr. Chairman, I will yield back.

Mr. WHITFIELD. Mr. Kinzinger, you are recognized 3 minutes.

Mr. MCKINLEY. Thank you, Mr. Chairman.

The NRC has previously informed Congress that it believes amending the Atomic Energy Act to eliminate the mandatory uncontested hearing on combined license and early site permit applications could enhance the efficiency of NRC operations.

Section 4 in my draft allows the Commission, if a hearing isn't requested by an affected person, to issue a construction permit, operating license, or amendment to such permits and licenses without holding a hearing.

Mr. Fertel, in your view, how would this provision improve regulatory efficiency at the NRC?

Mr. FERTEL. I think what it would do is allow both the licensee and the NRC staff to move forward on issues while a hearing is being done, which is, to be honest, very similar to a situation for the operating plants. So it would not delay the startup of a facility that might be critical to electricity, but certainly would not be making any revenue while it is sitting there.

If there was a true safety issue that it shouldn't start up, they are not going to allow it to do that. So it doesn't allow you to do something that is going to provide unsafe conditions.

Mr. KINZINGER. And what kind of regulatory and economic burdens are associated with the mandatory hearing requirement? How much can an uncontested mandatory hearing delay the process?

Mr. FERTEL. There is not great data. We have looked at that based upon the Vogtle experience and some of the other projects, and it is hard to decipher exactly because there was the design cert going through at the same time. But our estimate was it could have been an 80- to 120-day delay as a result with, to be honest, not significant value added by that because of all the other reviews.

Mr. MERRIFIELD. If I can just answer for a second on that one.

Mr. KINZINGER. Yes.

Mr. MERRIFIELD. Congressman, I think there are two issues associated with mandatory hearings. One of them is an issue of the extra time it takes. The other portion is the amount of staff activity that ultimately has to be borne by the applicant and the distraction it gives to actually getting to the ultimate decision. The staff, in preparing for those hearings, wants to make sure that everything they send up to the Commission is in a certain way. That eats up a huge amount of time.

As a commissioner, I recognized that there were extraordinary opportunities for the public to comment on the process that even led to the ultimate licensing, and indeed the mandatory hearing was an antiquated legacy of the 1950s that was not needed.

Mr. KINZINGER. Thank you.

And a lot more to ask, but duty calls, and I will yield back. Thank you all for being here.

Mr. WHITFIELD. The gentlemen yields back.

At this time I recognize the gentleman from Texas, Mr. Green, for 3 minutes.

Mr. GREEN. Thank you, Mr. Chairman.

I am a supporter of nuclear power, and I think to get to a carbon-free environment that is where we need to get to. I believe increased cooperation between DOE and NRC would create efficiencies and expedite the process of approving new reactors. Combined with the President's GAIN initiative, I think we can revitalize our nuclear sector and secure additional baseload power.

I do have some concerns about the Nuclear Utilization of Keynote Energy Policies Act. And I would like to ask some questions.

Mr. Merrifield, in your testimony you made reference to a 2016 white paper released by your organization that discussed framework for licensing modernization. The white paper listed five recommendations for Congress: proactive oversight of NRC's design review and licensing process; providing sufficient resources—and I

am guessing that means money; encouraging NRC to meet a 36-month deadline for review; and directing NRC to identify roadblocks to expedite approvals and submitting annual updates.

In your opinion, does the legislation before the subcommittee today adequately address these recommendations?

Mr. MERRIFIELD. In the main, I think it does. We actually I think focused on a couple of things that we would ask for improvement in the two bills that you are looking at today. One is to be really specific in requiring a pre-application vendor design review process. The other one was to providing a greater opportunity for engagement between the developers of advanced reactor technologies and the NRC at no cost early stages in the process to really enhance the level of understanding on the part of the agency and the developer.

Mr. GREEN. During your service as a commissioner, do you recall how many licensing reviews the NRC completed?

Mr. MERRIFIELD. How many licensing reviews?

Mr. GREEN. Yes.

Mr. MERRIFIELD. I would have to go back and do some research on that.

Mr. GREEN. If you could get that, I would appreciate it.

With respect to these reviews, do you have a sense of how many hearings did the Commission grant upon request under section 189 of the Atomic Energy Act?

Mr. MERRIFIELD. I would have to go back and review that one.

Mr. GREEN. OK. If you could get that for us.

And also under section 189, are formal adjudicatory procedures required of the Commission or do they have discretionary authority? Are they required to have those procedures or is it discretionary with the Commission?

Mr. MERRIFIELD. I am sorry, Congressman, I didn't hear that.

Mr. GREEN. Under section 189, are the formal adjudicatory procedures required of the Commission or do they have discretionary authority?

Mr. MERRIFIELD. Congressman—

Mr. FETTUS. I can answer that.

Mr. MERRIFIELD. I would like to have the opportunity to review those procedures and provide an appropriate response to the committee.

Mr. GREEN. OK.

Mr. Chairman, I will be glad to submit the questions.

And if you could get back to us.

Because, again, if we can move the process along. And coordination between agencies is never bad.

Thank you, Mr. Chairman.

Mr. WHITFIELD. Well, thank you.

And we appreciate you all being with us today. I am going to ask just a couple of questions.

We still have 3 minutes before we have to vote, Bobby, so no rush.

NuScale Power has stated their plans to submit its design certification application to the NRC by the end of 2016 for a so-called small modular reactor. And, Mr. Merrifield, I would just ask you,

what is your outlook for NRC's readiness to accept a high-quality application and review it in a timely manner?

Mr. MERRIFIELD. Congressman, I think the NRC has been preparing, as far as I can tell, I believe the NRC has been preparing itself to receive that application. It is a light-water reactor technology. It is something that the NRC is familiar with. And I think they will do their level best to accept it and review it in due course.

Mr. WHITFIELD. Do you agree with that, Mr. Fertel?

Mr. FERTEL. Yes, I think the way Jeff Merrifield answered is probably accurate. And I think that the division director there is a very competent young woman who I think is making sure that they are as prepared as they can be. So we would expect they will do as good a job as they can.

Mr. MERRIFIELD. Yes, I agree with that. Mr. Fertel references Jennifer Uhle, who is the director of the Office of New Reactors. She is a very talented young woman I think will do an exceptional job for that team.

Mr. WHITFIELD. Well, we hear a lot of discussion about small nuclear modular reactors and great hope for them. And some are sodium cooled, some are lead cooled, light water. How many of these so-called small modular reactors are there operating today around the world? Does anybody have any idea?

Mr. FERTEL. I don't think that from a commercial standpoint there is hardly any. But all of our submarines are using small modular reactors and our aircraft carriers. So there is experience with them. Now, they are different, but there is a lot of experience.

And in our country right now, Mr. Chairman, electricity growth, thanks to really very good efficiency and things like that, and also probably being hurt by our economy a bit, but our electricity growth is really very small. So small modular reactors are becoming actually even more important domestically. We always thought they were important internationally. But even domestically they are becoming very important, particularly as you replace older smaller coal plants and eventually even gas plants.

Mr. MERRIFIELD. Mr. Chairman, one thing I think is important to remember, particularly about advanced reactor technologies, we talk about traditional utility uses for generating electricity. What is important to remember is these technologies also provide very high sources of heat. So the new users of these technologies may not necessarily be just our traditional utilities. It may be also for other industrial processes that can utilize that heat and power.

Mr. WHITFIELD. Anybody else have any comment? OK.

Mr. ALLEN. Yes, I would just agree that they are looking at a large number of different commercial products than just gigawatt-scale nuclear.

Mr. WHITFIELD. So when we talk about small, are we talking about below 300 megawatts or so?

Mr. MERRIFIELD. Yes. Some of them that are conceptualized could be as small as 3 to 10 megawatts. Some of them are in the range of 80 to 100. Others are on sort of the verge of 300. So there is a range of the potential reactors being proposed.

Mr. FETTUS. Chairman Whitfield, though, there is one caution. The only ones that we have seen that have had any indication of any economic viability have been coupled together in the several-

hundred megawatt range to allow for some economy of scale to actually be able to compete in a market. And none of these are built around the world. The number is actually zero. And the question of whether or not they will have any chance in a competitive marketplace in 10, 12, 15 years, no one has a crystal ball here.

Mr. MERRIFIELD. Well, no one has a crystal ball, but at the end the market is going to resolve that. That is what we are asking for, a predictable regulatory regime that those reactors can be licensed through. If they can't come up with the economics that the market will bear, those reactors will not go forward.

Mr. WHITFIELD. Well, listen, thank you all very much. We look forward to working with you as we consider these two pieces of legislation and other issues as well.

We will keep the record open for 10 days.

And once again, thank you. And that concludes today's hearing.

[Whereupon, at 10:41 a.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

PREPARED STATEMENT OF HON. FRED UPTON

With two nuclear power plants just miles from my home in Southwest Michigan, I know firsthand the importance of safe, clean nuclear energy to the nation's energy portfolio, as well as the economic benefits nuclear brings to local communities. Nearly thirty percent of Michigan's electricity is generated by nuclear power and the industry supports more than 2,900 highly skilled employees in the state. Because of the large role nuclear energy plays in Michigan and across the country, it's imperative that folks have confidence in the Nuclear Regulatory Commission's mission to protect public health and safety. This mission can, and should, be achieved while also providing regulatory certainty for NRC licensees and stakeholders. And the simple fact is we can't have nuclear power without the NRC.

As a fee-based organization, Michigan ratepayers fund the NRC through utilities in annual fee assessments. This structure requires continued Congressional oversight to assure the NRC diligently manages its operations and continually strives to become more efficient. The proposed legislation for review this morning seeks to do just that.

Over half of today's nuclear power plants commenced operation over thirty years ago and many are likely to enter the decommissioning process in the next decade. The age of the existing fleet should encourage policymakers to look to the next generation of nuclear energy technologies. The NRC's existing regulatory structure was designed to license and oversee light water reactor technology that was developed as a result of a policy choice due to our nuclear navy. Today, innovative engineers are developing promising new nuclear technologies that could bring significant design improvements to take us beyond the current fleet of nuclear power plants.

In order to achieve this goal, private stakeholders must understand the criteria by which the NRC will accept non-light water reactor designs. It is also important for the NRC be prepared to receive and review these designs in a timely manner. Congressman Latta's bill, the Advanced Nuclear Technology Development Act, will direct NRC to fulfill those obligations. I thank him for his forward thinking on this issue.

Representative Kinzinger's discussion draft highlights the importance of NRC licensees to maintain confidence that licensing and other regulatory activities are resolved in a timely, efficient, and safe manner. The proposed legislation would maintain the existing "gold standard" of safety regulation by the NRC, while implementing some commonsense policies and process changes. I recognize that there may be differing viewpoints in how to achieve this high standard and I hope today's hearing is a constructive step in facilitating those discussions. I look forward to exploring these issues in greater detail as we have an eye toward our nuclear future.

PREPARED STATEMENT OF HON. FRANK PALLONE, JR.

Thank you, Mr. Chairman. I appreciate the opportunity today to examine two pieces of legislation related to the licensing and review of nuclear power reactors here in the United States.

The first bill under consideration is H.R. 4979, the Advanced Nuclear Technology Development Act of 2016, introduced by Representatives Latta and McNerney. The bill seeks to enhance coordination between NRC and the Department of Energy through a memorandum of understanding on issues related to advanced nuclear reactor technology. This is a worthy goal and a commonsense way for the federal government to support the advanced nuclear power industry.

The bill also requires NRC to develop an advanced reactor regulatory framework to evaluate the options to expedite advanced reactor licensing and make it more predictable. NRC would have 270 days from the date of enactment to submit this plan to the Energy and Commerce Committee. The plan must also seek input from interested stakeholders, which is crucial. I support this approach, but want to hear more about whether 270 days is a realistic timeframe.

The second proposal before us, is a discussion draft put forth by Representative Kinzinger entitled the Nuclear Utilization of Keynote Energy Policies Act.

I believe nuclear power must play a continued role in our energy future. It is a clean source of power that has helped reduce our dependence on fossil fuels. Today the industry faces the dual challenges of working to extend the life of our country's existing reactors—many of which are reaching the end of their 40 year licenses—while also pursuing innovative advanced nuclear technologies that could be more cost-effective, efficient and produce less waste.

Members on both sides of the aisle believe that this is an important issue for our committee to consider, and I want to commend Mr. Kinzinger for putting forth this draft and beginning this critical discussion.

However, while we should explore opportunities to support and sustain nuclear power in the U.S., we cannot lose sight of the critical importance of maintaining robust nuclear safety and oversight to protect public health and the environment. We must strike the right balance. This week marks the 30th anniversary of the Chernobyl nuclear disaster, which provides us with a sober reminder of the dangers posed by nuclear technology if not properly regulated and controlled.

So, I am concerned that, in its current form, this proposal goes too far in one direction, minimizing public input into the licensing process, eliminating critical hearings on the licensing process, unrealistically shortening the licensing review timeline, and drastically reducing the portion of NRC's budget that is covered by licensee fees.

Currently, NRC recovers 90 percent of its budget from licensee fees. Section 2 of the discussion draft would shift a number of commission activities out of the portion of the budget covered by fees. One of those areas would be "infrastructure and corporate support," which includes administrative services, acquisitions, training and travel. This section alone is funded at over \$300 million in the Fiscal Year 2017 Energy and Water Appropriations bill that has passed committee. So, this provision would shift over \$300 million to taxpayers instead of industry.

Further, this discussion draft eliminates the mandatory public hearing that is held before a combined license is approved, which allows construction of the facility to move forward. This hearing is a one-day proceeding that provides a holistic review of the license application, and it is a valuable tool for the NRC commissioners to evaluate the staff's review of the license application. The mandatory hearing also provides an important opportunity for the public to become involved in the licensing process. In fact, just last month, a mandatory hearing was held on the early site permit application for a site adjacent to the Salem and Hope Creek nuclear power plants in New Jersey and that permit was issued yesterday. Past mandatory hearings have brought to light serious issues that may have otherwise gone unchecked.

I will say that it is unfortunate that the NRC was not invited to testify today. Both proposals would make significant changes to the way NRC addresses nuclear licensing, and I believe it is critical for us to hear from the Commission as we continue with this process.

That said, I would like to thank the Chairman for holding today's hearing. While I have raised some concerns today, I do look forward to working together with my colleagues on these issues.

MARVIN S. FERTEL
President and Chief Executive Officer
 1201 F Street, NW, Suite 1100
 Washington, DC 20004
 P: 202.739.8125
 msf@nei.org
 nei.org



April 25, 2016

The Honorable Bob Latta
 U.S. House of Representatives
 2448 Rayburn House Office Building
 Washington, DC 20515

The Honorable Jerry McNerney
 U.S. House of Representatives
 2265 Rayburn House Office Building
 Washington, DC 20515

Dear Representatives Latta and McNerney:

On behalf of the commercial nuclear energy industry, the Nuclear Energy Institute (NEI¹) expresses its support for the "Advanced Nuclear Technology Development Act of 2016," H. R. 4979, introduced on April 18, 2016. NEI and its members appreciate the bipartisan effort to promote the development of advanced nuclear reactor technologies.

We commend the introduction of legislation that recognizes the importance of commercial nuclear energy as the source of nearly 20 percent of our nation's electricity and approximately 63 percent of our carbon-free electricity. Nuclear energy facilities demonstrate unmatched reliability by operating with an average capacity factor of more than 90 percent—higher than all other electricity sources. Nuclear energy facilities are essential to the country's economy and the communities in which they operate. It is important that we maintain the nation's nuclear fleet and prepare a path for advanced reactor designs so the U.S. can continue to benefit from this baseload power source. This bill, if passed, will provide environmental and economic benefits to all Americans by helping to ensure nuclear energy continues to be a significant contributor to our nation's standard of living, national security, economic growth and influence in the international arena.

NEI also strongly believes there must be a congressional mandate to accelerate the licensing and commercialization of new reactor technologies. This bill is intended to "foster civilian research and development of advanced nuclear energy technologies and enhance the licensing and commercial deployment of such technologies." Outdated, time-consuming NRC regulatory and licensing processes challenge our ability to build new, innovative reactors. Responding to that problem, the bill appropriately emphasizes that a "performance-based, risk-informed, efficient, and cost-effective regulatory framework with defined milestones and the opportunity for applicants to demonstrate progress through NRC approval" is needed for advanced reactor designs. The legislation recognizes that because developers of advanced technologies do not have infinite resources or unlimited time to bring their designs to market, the NRC must implement its licensing responsibilities more efficiently and without imposing unjustified costs.

To kick-start development of a more efficient and appropriate regulatory framework, the bill directs the NRC to send to Congress within 270 days an advanced reactor licensing plan. This plan will address key topics including options for

¹ NEI is responsible for establishing unified industry policy on regulatory, financial, technical and legislative issues affecting the commercial nuclear energy industry. NEI has more than 350 members, including all U.S. companies licensed to operate commercial nuclear power plants, as well as nuclear plant designers, architect-engineering firms, fuel cycle facilities, nuclear materials licensees, labor organizations, universities and other organizations involved in the nuclear energy sector.

NUCLEAR. CLEAN AIR ENERGY

The Hon. Bob Latta
The Hon. Jerry McNerney
April 25, 2016
Page 2

licensing advanced reactors under current NRC regulations, a new NRC regulatory framework, or a combination of the two options for expediting, streamlining, and enhancing the predictability of advanced reactor licensing, and incorporation of consensus-based codes and standards into the advanced reactor framework. Further, the bill directs NRC to include in the plan options for applicants to use "phased review processes," which would feature innovative approaches such as NRC review and conditional approval of partial applications, early design information, and submittals containing design criteria and processes to be used to develop information to support a later phase of the design review. Such a phased review and licensing process is designed to allow applicants to demonstrate the ongoing viability of first-of-a-kind projects to potential investors and other project participants. Notably, the NRC plan must include cost estimates, budgets and specific milestones for implementing this new framework by 2019.

In addition, allowing for funds to be appropriated for NRC activities for the development of regulatory infrastructure for advanced nuclear reactor technology is an important step to ensuring NRC resources are available to lay the groundwork for licensing these new technologies.

On behalf of NEI and its members, I want to express NEI's sincere appreciation to the bill's sponsors for working together to create legislation to tackle these difficult issues. The efforts of Congress to set the stage for developing and deploying innovative nuclear reactor technologies are important, timely, and extremely valuable to the industry.

Sincerely,



Marvin S. Fertel

American Nuclear Society
555 N. Kensington Ave.
La Grange Park, IL 60526
708-352-6611



April 20, 2016

Honorable Fred Upton
Chairman
Energy and Commerce Committee
U.S. House of Representatives
Washington, D.C. 20515

Honorable Frank Pallone
Ranking Member
Energy and Commerce Committee
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman and Ranking Member Pallone:

I write on behalf of the over 11,000 men and women of the American Nuclear Society to express our support for H.R. 4979, the Advanced Nuclear Technology Development Act.

It is becoming increasingly clear that the U.S. and the world will need to significantly expand nuclear generating capacity in the coming decades to address growing energy demands while reducing emissions of greenhouse gases.

Expanded federal engagement in advanced, non-light-water nuclear research and development is critical to achieving these overall objectives. The Advanced Nuclear Technology Development Act would assist U.S. companies in accessing the full range of technical capabilities within the federal government and national laboratories; accelerate development of world-leading scientific user facilities; and promote broader technology commercialization through public-private partnership initiatives and accelerated licensing programs.

Historically, the U.S. has led the world in developing new reactor technology. However, several other nations, including Russia and China, have moved aggressively to develop innovative Generation IV reactors which offer distinct advantages over current designs.

The U.S. must recommit itself to improving its advanced reactor technology portfolio in order to ensure future access to abundant clean energy and to maintain its influence over global nuclear safety and nonproliferation norms. This legislation, if enacted, would provide needed support toward those objectives.

Sincerely,



Eugene S. Grecheck
President
American Nuclear Society



April 28, 2016

Chairman Ed Whitfield
Energy and Power Subcommittee
U.S. House of Representatives Committee on Energy and Commerce
Washington, DC 20515

Ranking Member Bobby Rush
Energy and Power Subcommittee
U.S. House of Representatives Committee on Energy and Commerce
Washington, DC 20515

Dear Representatives,

On behalf of ClearPath Action, a 501(c)4 organization working to accelerate conservative clean energy solutions, we wish to express our support for Congressman Latta's legislation HR 4979, the Advanced Nuclear Technology Development Act of 2016.

Nuclear power is one of the most important energy resources of the United States, representing a triumph of American ingenuity and engineering. Nuclear energy is highly reliable, clean and affordable, and is a vital part of our electricity mix.

Nuclear plants built decades ago still safely provide 20% of our electricity. But as these plants near retirement, a new generation of advanced nuclear technology is being developed by dozens of companies and universities across the nation. Advanced nuclear reactors promise benefits from increased safety and affordability, resistance to proliferation, and the ability to run on old nuclear waste.

Several of these advanced nuclear companies will begin applying for design certifications within the next 5 years, and one company called NuScale Power plans to apply by the end of 2016. However, expensive and arduous regulations at the NRC are encouraging others to build abroad for initial deployment.

Instead of driving our engineers overseas, we should be promoting a regulatory environment that is safe, innovative and efficient. The Advanced Nuclear Technology Development Act of 2016 directs the NRC to plan for a technology-neutral licensing plan that promotes safety without being overly prescriptive. Furthermore, the bill modifies the NRC fee recovery mechanism so today's nuclear operators aren't required to fund other companies' advanced nuclear technologies.

Along with H.R.4084, the Nuclear Energy Innovation Capabilities Act, which has already passed both chambers, this legislation builds a new wave of policy promoting nuclear innovation that can help put America on a pathway to a conservative clean energy future.

Sincerely,

A black rectangular redaction box covering the signature of Jay Faison.

Jay Faison
President

ClearPath Action Fund for Conservative Clean Energy, Inc.
300 New Jersey St, NW, #907
Washington, DC 20001

cc: Representatives Robert Latta and Jerry McNerney



THE CLEAN ENERGY PROGRAM

April 28, 2016

The Honorable Bob Latta
2448 Rayburn House Office Building
Washington, D.C. 20515

Dear Congressman Latta:

I am writing to voice support for your recently-introduced legislation, H.R. 4979, the Advanced Nuclear Technology Development Act of 2016. Third Way strongly supports advanced nuclear technologies and is working to provide a viable path towards commercialization, as well as to ensure that the United States remains a global leader in nuclear innovation.

To do this, U.S. policy must provide a viable path to commercialization for advanced nuclear technologies with enhanced performance, safety, and economic characteristics. The current structure of certain processes at the Nuclear Regulatory Commission (NRC), however, may actually act as a deterrent to safe and economical operation and advancement of nuclear technology.

While innovation in the private sector has grown rapidly over the past several years, regulatory uncertainty at the NRC is hampering long-term investment. The current licensing process was developed for a previous generation of technology and is ill-equipped for advanced reactors. Your bill would require the NRC to report on how they could best provide a pathway for advanced reactor licensing in a way that is consistent with the agency's role in protecting public health and safety, as well as security and the common defense.

We applaud your introduction of H.R. 4979 and hope it moves quickly through the Committee. The United States government plays a vital role in the future of the advanced nuclear sector and this bill establishes the regulatory certainty the industry needs to succeed.

Sincerely,



Josh Freed
Vice President for the Clean Energy Program
Third Way



April 27, 2016

The Honorable Robert E. Latta
Energy and Commerce Committee
U.S. House of Representatives
Washington, DC 20515

The Honorable Jerry McNerney
Energy and Commerce Committee
U.S. House of Representatives
Washington, DC 20515

Dear Congressmen Latta and McNerney:

I am writing on behalf of the Clean Air Task Force to express support for HR.4979, the "Advanced Nuclear Technology Development Act of 2016."

Clean Air Task Force (CATF) is a non-profit environmental organization dedicated to catalyzing the development and deployment of low emission energy technologies through research and analysis, public advocacy leadership, and partnership with the private sector.

Climate change is an enormous challenge. To have the greatest chance of success, CATF's position is that we will likely need all of the low-carbon energy technologies available, including nuclear power. Therefore, Clean Air Task Force strongly supports HR.4979 in its efforts to enable the efficient licensing and commercialization of advanced nuclear technologies. Section 5, which directs the Secretary to report to Congress on the potential for the Department of Energy to facilitate the testing and demonstration of advanced reactors on Department land is of great importance.

HR.4979 has the potential to improve the effectiveness and efficiency of the Nuclear Regulatory Commission (NRC) and to accelerate the advancement of important technologies for addressing climate change. CATF supports this legislation and we appreciate your leadership in moving this important work forward.

It will be critically important that adequate appropriations are made to ensure that the NRC can undertake the activities described in Section 6, "Advanced Reactor Regulatory Framework," and to ensure that the NRC can effectively perform its oversight role.

Thank you for your consideration. If you have any questions, please do not hesitate to contact me at 617-733-5458 or afinan@catf.us.

Best Regards,



Ashley E. Finan, Ph.D.
Project Director, Advanced Energy Systems
Clean Air Task Force



One Broadway, 14th Floor
Cambridge, MA 02142

April 28, 2016

The Honorable Fred Upton, Chairman
The Honorable Frank Pallone, Ranking Member
The Honorable Ed Whitfield, Chairman, Subcommittee on Energy and Power
The Honorable Bobby Rush, Ranking Member, Subcommittee on Energy and Power

House Committee on Energy and Commerce
Washington, D.C. 20515

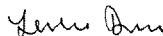
Dear Chairman Upton, Ranking Member Pallone, Chairman Whitfield, and Ranking Member Rush,

As CEO and co-founder of Transatomic Power Corporation, I am writing to thank you for this opportunity to express our support for the Advanced Nuclear Technology Development Act of 2016. Transatomic Power counts among our nation's approximately forty advanced, non-light water nuclear reactor firms that are currently in the design and development phases, and to date, we are entirely supported by private capital. Transatomic seeks to engage with American universities, National Laboratories, and the U.S. Department of Energy to push the frontier of scientific discovery, foster a sustainable energy supply, and maintain U.S. leadership in nuclear technology applications.

Among the greatest challenges facing those of us developing advanced nuclear technology is the lack of a clear pathway to navigate the Nuclear Regulatory Commission's licensing process. This bill enables the formation of just such a pathway, in addition to ensuring that the Nuclear Regulatory Commission can continue to fulfill its vital mission to protect public health and safety during the advanced reactor development process. Overall, the bill lays the groundwork for nuclear energy to flourish in the United States, and we join with the rest of the advanced nuclear community in commending this support for what will be an essential component of a diverse clean energy portfolio in the 21st century.

We at Transatomic Power thank you for your dedication to the American nuclear industry and for your continued service to the nation. We are proud to be among your many supporters in this larger effort to achieve sustainable American energy independence.

Sincerely,



Dr. Leslie Dewan
Chief Executive Officer
Transatomic Power Corporation

cc: The Honorable Robert Latta
The Honorable Jerry McNerney

FRED UPTON, MICHIGAN
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY
RANKING MEMBER

ONE HUNDRED FOURTEENTH CONGRESS
Congress of the United States
House of Representatives
COMMITTEE ON ENERGY AND COMMERCE
2125 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-6115
Majority (202) 225-2927
Minority (202) 225-3641

May 26, 2015

Mr. Marvin Fertel
President and CEO
Nuclear Energy Institute
1201 F Street, N.W., Suite 1100
Washington, DC 20004

Dear Mr. Fertel:

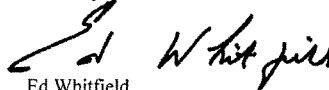
Thank you for appearing before the Subcommittee on Energy and Power on Friday, April 29, 2016, to testify at the hearing entitled "H.R. 4979, the Advanced Nuclear Technology Development Act of 2016 and H.R. _____, Nuclear Utilization of Keynote Energy Policies Act."

During the hearing, Members asked you to provide additional information for the record, and you indicated that you would provide that information. Descriptions of the requested information are provided in the attached document. The format of your responses should be as follows: (1) the name of the Member whose request you are addressing, (2) the complete text of the request you are addressing in bold, and (3) your answer to that request in plain text.

To facilitate the printing of the hearing record, please respond to these requests with a transmittal letter by the close of business on June 9, 2016. Your responses should be mailed to Will Batson, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed in Word format to Will.Batson@mail.house.gov.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Ed Whitfield
Chairman
Subcommittee on Energy and Power

cc: The Honorable Bobby Rush, Ranking Member, Subcommittee on Energy and Power

Attachment

Answers to Questions for the Record Received May 26, 2016
Marvin S. Fertel
President and Chief Executive Officer
Nuclear Energy Institute
Before the House Energy and Commerce Committee
Hearing on H.R. 4979, “Advanced Nuclear Technology Development Act of 2016” and
H.R. ___, “Nuclear Utilization of Keynote Energy Policies Act” (Apr. 29, 2016)

Questions from the Honorable Ed Whitfield:

- 1. Your testimony notes that a number of existing power plants may enter the decommissioning process in the near future. First, is the existing decommissioning process safe and does it protect public health and environment?*

Answer:

The existing decommissioning process for commercial nuclear power reactors is safe and protective of public health and the environment. To date, ten power reactors have been successfully decommissioned under the oversight of the Nuclear Regulatory Commission (NRC) and the agency is currently overseeing the ongoing decommissioning of 19 additional power reactor units at 17 sites across the country. In its recent Advanced Notice of Proposed Rulemaking (ANPR) on decommissioning, the NRC confirmed that the decommissioning process continues to ensure protection of public health and safety. The NRC stated that it had “not identified any significant risks to public health and safety in the current regulatory framework for decommissioning power reactors” and confirmed that its current rulemaking activities are “not based on any identified safety-driven or security driven concerns.”¹

The agency’s current decommissioning program includes both regulations and guidance that cover a wide range of decommissioning-related activities, from funding assurance to site restoration. The NRC’s current decommissioning framework had its genesis in a rulemaking that unfolded over a ten-year period and culminated in a 1988 final rule.² The NRC clarified ambiguities in the 1988 rule in 1996. That revision codified procedures to reduce regulatory burden, provide greater flexibility, and allow greater public participation in the decommissioning process.³ Within a year of the 1996 rulemaking, the NRC promulgated generic, dose-based standards for determining the extent to which lands and structures must be remediated before decommissioning of a site can be considered complete.⁴ Most recently, the NRC promulgated changes to its decommissioning planning regulations to expressly require that power plant

¹ 80 Fed. Reg. 72,358 (Nov. 19, 2015).

² 53 Fed. Reg. 24,018, 24,019-20 (June 27, 1988).

³ See 61 Fed. Reg. 39,278 (July 29, 1996).

⁴ 62 Fed. Reg. 39,058 (July 21, 1997).

licensees minimize contamination during operation and monitor the subsurface in radiation surveys already required by the agency's rules.⁵

The NRC's current regulatory structure also provides for decommissioning funding assurance through multiple layers of requirements and limitations, which apply from the time of initial licensing through the time of license termination. These requirements and limitations include:

- Establishing a minimum certification amount representing the minimum amount of decommissioning financial assurance that power reactor licensees must provide during operation.⁶
- Requiring adjustment of the minimum certification amount annually to account for changes in estimated labor, energy, and low-level radioactive waste disposal costs.⁷
- Limiting funding assurance mechanisms to those considered appropriate by the NRC for assuring that decommissioning funding will be available when needed.⁸
- Limiting the estimated future growth of decommissioning funds over time to a conservative rate of return over inflation, absent allowance of a different rate of return by a rate-setting authority.⁹
- Requiring a biennial report on the status of decommissioning funds during operation.¹⁰
- Providing for updating of funding levels, if necessary.¹¹
- Requiring a more precise preliminary decommissioning cost estimate at or about five years prior to plant shutdown, and requiring a site-specific cost estimate within two years of plant shutdown.¹²
- Requiring an annual financial assurance status report during decommissioning.¹³
- Requiring an updated site-specific estimate of remaining decommissioning costs at least two years prior to license termination.¹⁴
- Prohibiting use of decommissioning funds for any purpose other than decommissioning, both during operation and after plant shutdown.¹⁵

In sum, from a safety and environmental protection standpoint, the NRC's regulatory framework for decommissioning nuclear power reactors is sound. Further, the industry has extensive

⁵ 76 Fed. Reg. 35,512 (June 17, 2011). See also 10 C.F.R. §§ 20.1406, 20.1501.

⁶ See 10 C.F.R. § 50.75(c).

⁷ See 10 C.F.R. § 50.75(b).

⁸ See 10 C.F.R. § 50.75(e).

⁹ *Id.*

¹⁰ 10 C.F.R. § 50.75(f).

¹¹ See 10 C.F.R. § 50.75(e)(2).

¹² 10 C.F.R. §§ 50.75(f)(3), 50.82(a)(4)(i).

¹³ 10 C.F.R. § 50.82(a)(8)(v).

¹⁴ 10 C.F.R. § 50.82(a).

¹⁵ See 10 C.F.R. § 50.82(a)(8).

experience in undertaking and the NRC has extensive experience overseeing the decommissioning of nuclear power reactors in the United States.

A. How would a revised decommissioning process increase efficiency?

Answer:

Although the NRC's regulatory framework for decommissioning covers a wide range of activities and provides for the safe decommissioning of power reactors, one area that is not explicitly addressed is the transition from operating to defueled status. On this score, the Commission has long recognized the reduction in risk inherent in transitioning a commercial nuclear power plant from operation to a defueled condition. For example, in its 1996 final rule, the Commission concluded that during the decommissioning stage, "[s]afety concerns for a spent fuel pool are greatly reduced regarding both control of the nuclear fission process and the resultant generation of large amounts of heat, high neutron flux and related materials degradation, and the stresses imposed on the reactor system."¹⁶ In its recent ANPR, the NRC emphasized the continued validity of these prior conclusions, stating: "When compared to an operating reactor, the risk of an offsite radiological release is significantly lower, and the types of possible accidents are significantly fewer, at a nuclear power reactor that has permanently ceased operations and removed fuel from the reactor vessel."¹⁷

Despite these conclusions, many NRC regulations applicable to *operating nuclear power plants* continue to apply after facilities have permanently shut down, defueled, and entered the decommissioning process. That is, the current regulatory framework does not recognize the inherent reduction in risk that occurs at *all plants*, as they defuel and progress through the decommissioning process. As a result, facilities that have permanently ceased operations and defueled must either continue complying with requirements that are intended to apply to operating plants, or pursue facility-specific exemptions and license amendments to ensure the requirements applicable during decommissioning appropriately address the facility's risk profile.

Requiring facility-specific exemptions and licensing actions to ensure that requirements reflect reductions in risk at all plants undergoing decommissioning is inefficient and creates undue burden, particularly because the decisions at issue are capable of being resolved generically via rulemaking. An appropriately scoped rulemaking that identifies several generic decommissioning milestones or transition points at which requirements can be adjusted to reflect the reduced risk profile associated with a permanently defueled facility would eliminate the need for most facility-specific exemptions and license amendments that are currently necessary to efficiently transition through the decommissioning process. These proposed milestones and the associated regulatory requirements could be derived primarily from the plant-specific licensing actions that have already been approved by the NRC staff. In our comments on the NRC's

¹⁶ 61 Fed. Reg. at 39,279.

¹⁷ 80 Fed. Reg. at 72,361.

ANPR, NEI provided detailed recommendations for rule changes in areas such as emergency preparedness, security, insurance, staffing, and training.¹⁸

2. *Your testimony raises the point that corporate support costs result in additional costs to licensees and, in turn, ratepayers. What are some options to reduce this financial burden without just shifting the costs to the American taxpayers?*

Answer:

In an April 2015 congressionally-mandated report, Ernst and Young found that the NRC spends 37 percent of its budget on mission support costs (*i.e.*, overhead).¹⁹ The NRC's peer agencies spend only 20, 25, and 32 percent of their total budgets on mission support.²⁰ Ernst and Young also found that "[w]ith the exceptions of FY 2015 and FY 2016, NRC's mission support costs as a percentage of total outlays have increased year-over-year for the last decade."²¹ To help roll back this decade-long increase in overhead costs, Congress limited the portion of the NRC's FY 2016 budget allocated to corporate support (which constitutes the bulk of NRC's mission support costs) to roughly one-third (34 percent) of the agency's total budget. The NRC recently indicated in its FY 2017 budget justification that it would remain below this cap in FY 2016, spending about 32 percent of its budget on corporate support.²²

Notwithstanding this recent effort to limit the NRC's longstanding increases in corporate support costs, the NRC's FY 2017 budget would *increase* corporate support costs to more than \$319 million—an increase both in real dollars (an additional \$3.3 million) and as a percent of the agency's total budget (bringing it to 33 percent).²³ Given the NRC's actions and its apparent willingness to continue increasing its level of corporate support, legislation is needed to ensure the NRC's overhead costs are consistent with its peer agencies. One effective approach to drive greater efficiency in agency operations would be to establish a cap on the percentage of the NRC's budget that it can spend on corporate support. Using this approach, Congress could start with a more modest cap and phase in more aggressive targets over several years, thereby placing the NRC on a trajectory to reduce its corporate support to a more reasonable level by implementing cost reductions such as those already identified by Ernst and Young and the agency's Project Aim efforts. While Congress would need to ensure the cap on corporate support is low enough to incentivize significant efficiency improvements, any cap has the benefit of not shifting costs to the American taxpayer.

¹⁸ See Letter from Rod McCullum, Industry Comments on the NRC Advance Notice of Proposed Rulemaking (ANPR) on Regulatory Improvements for Decommissioning Power Reactors; Docket ID: NRC-2015-0070" (Mar. 17, 2016) (ML16081A486).

¹⁹ Letter from NRC Chairman Burns to Honorable Thad Cochran (May 1, 2015), Attach. 3, Ernst and Young, Final Report, Overhead Assessment Nuclear Regulatory Commission at 3 (Apr. 30, 2015) (ML15100A369) ("Ernst and Young Report").

²⁰ *Id.* at 15.

²¹ *Id.* at 5.

²² NUREG-1100, Vol. 32, NRC, Congressional Budget Justification: Fiscal Year 2017 at 95 (Feb. 2016) (ML16036A086).

²³ *Id.*

An additional benefit of a cap on corporate support is that it would not constrain the NRC's ability to decide how to allocate resources among the numerous items currently covered by that category of spending, which includes spending on acquisitions, administrative services, financial management, human resources, information management, information technology, outreach, policy support, and training.²⁴ This means that a cap to bring the NRC's spending on corporate support in line with other federal agencies would not, for example, impair the agency's ability to provide physical and personnel security services for the agency's facilities and employees. Although the NRC has noted that it "has additional security requirements that contribute to higher costs in areas such as physical and personnel security," those costs constitute only one portion of the "administrative services" portion of the corporate support budget.²⁵ Given that administrative services constitutes only about a third of the entire corporate support budget, the NRC has many other areas where it can identify efficiencies to bring its corporate support spending in line with other federal agencies.²⁶

3. *Your testimony notes the trend in length of time for NRC to review and act upon license applications. How does that increased time impact the applicant and what are the economic ramifications of this trend?*

Answer:

Since 2011, the NRC has, on average, nearly doubled the time it takes to review license renewal and power uprate applications.²⁷ Unfortunately, we have seen a similar trend with the NRC's review of new plants applications. The reviews for the first four early site permits (ESPs) took about 3 to 4 years, whereas the review for the most recent ESP application for the PSEG site lasted nearly 6 years.²⁸ Recent and ongoing reviews for combined licenses (COLs) have likewise taken longer than the 4 years that it took for the NRC to review the first four COLs; the NRC has taken more than 8 years to review subsequent COLs.²⁹

These longer reviews are often the result of the NRC's ineffective and inefficient management of its request for additional information (RAI) process, which correspondingly increases the cost of the NRC's review fees. In a 2013 report entitled, "New Reactor Licensing Process Lessons Learned Review: 10 CFR Part 52," the NRC staff identified problems with how the agency manages RAIs. This report reflected a review of several design certification and COL applications involving thousands of RAIs, and found that many were duplicative, inconsistent,

²⁴ See *id.* at 96.

²⁵ *Id.* at 111; see also *id.* at 97.

²⁶ See *id.* at 96. To be sure, Ernst and Young has identified physical security as an area where the NRC should identify cost reductions, recommending that the agency examine the size and deployment of security staffing at NRC facilities "to identify opportunities to reduce costs without decreasing effectiveness." Ernst and Young Report at 20. The NRC agreed with this recommendation and has started to implement it as part of Project Aim. See SECY-15-0109, Assessment of the Recommendations in the April 30, 2015 Ernst and Young Overhead Assessment, Encl. 2, Assessment of Cost Reduction Recommendations at 14-15 (Sept. 16, 2015) (ML15239B326).

²⁷ See Letter from NRC Chairman Burns to Honorable James Inhofe (Apr. 7, 2015), Encl., Responses to Requests for Information Senators James Inhofe and Shelley Moore Capito Letter Dated March 24, 2015, at 13-28 (ML15086A177).

²⁸ See *id.* at 33.

²⁹ See *id.* at 30-33.

or outside the required scope of NRC safety findings. The NRC's data also reveals problems with the RAI process used in other licensing reviews. For example, in recent years the agency has significantly increased the average number of RAIs it has issued when considering NRC license renewal and power uprate applications.³⁰

Rather than longer review times and increases in RAIs, the industry would have expected the NRC to apply improvements and efficiencies when reviewing subsequent applications. These unnecessarily longer and more extensive reviews can add significant financial costs for an applicant. For example, from 2000 to 2010, the NRC on average completed each reactor license renewal review in 24 months and billed \$2.86 million in fees.³¹ However, since 2011 each of these figures has moved in the wrong direction: the NRC has on average completed each license renewal application review in 40 months and billed \$4.02 million in fees.³²

Questions from the Honorable Michael Doyle:

- 4. Mr. Fertel, Congress limited the portion of the NRC's FY 2016 budget allocated to corporate support (which constitutes the bulk of NRC's mission support costs) to roughly one-third (34 percent) of the agency's total budget. Is it your position that this level is still too high and that Congress should take further action to bring the NRC's overhead costs in line with other federal agencies?***

Answer:

The industry fully supports Congress limiting the portion of the NRC's FY 2016 budget allocated to corporate support. However, one-time limitations are not enough to bring the NRC's overhead costs in line with other federal agencies. Although the NRC recently indicated it will meet the cap imposed by Congress in FY 2016 and will spend only about 32 percent of its budget on corporate support,³³ in reality this reduction is both illusory and short-lived. Some of this reduction appears to be the result of the NRC simply "realigning" (*i.e.*, re-categorizing) certain activities that previously would have been listed as corporate support.³⁴ And even with this realignment, the NRC's FY 2017 budget would *increase* corporate support spending both in real dollars (an additional \$3.3 million) and as percent of the agency's total budget (bringing it to 33 percent).³⁵

Given the NRC has neither aggressively implemented nor sustained relatively modest cost reductions such as those identified by Ernst and Young and the agency's Project Aim efforts, Congress should take further action to bring the NRC's overhead costs in line with other federal agencies. As I noted in my response to question number 2, one effective approach to drive greater efficiency in agency operations and, in turn, drive down annual fees, would be for

³⁰ See *id.* at 14-20, 23-27.

³¹ See *id.* at 23-27.

³² See *id.*

³³ NUREG-1100, Vol. 32, NRC, Congressional Budget Justification: Fiscal Year 2017 at 95 (Feb. 2016) (ML16036A086).

³⁴ See *id.* at 112-114.

³⁵ *Id.* at 96.

Congress to establish caps on the percentage of the NRC's budget that it can spend on corporate support. Using this approach, Congress would have long-term certainty that the agency was implementing sustainable efficiency measures.

5. *The COO of your organization recently testified before EPW in the Senate and explained that NRC review fees for operator reactor license renewals have increased annually at a rate of almost 17% since 2000. Could you explain the impact this has on nuclear facilities?*

Answer:

As I noted in my response to question number 3, inefficient licensing reviews have higher costs. In addition to higher licensing costs, the regulatory uncertainty associated with an inefficient and unpredictable licensing process may deter existing plants operators from seeking license renewal and may dissuade developers from committing to construct and operate new nuclear power plants. At bottom, it is difficult for companies to engage in reasonable planning, when they cannot predict with any certainty the length of the NRC's review. Our concerns stem from the NRC's failure to maintain schedules for issuance of licenses for nuclear power plants. Reducing the duration of the NRC's licensing reviews would not only reduce the cost of the reviews for both NRC and applicants but perhaps more importantly, would provide certainty that will enable applicant and energy planners to ensure nuclear generation's place in our future.

A. *Do you think this draft legislation could help address those issues?*

Answer:

The draft legislation would help to address the trend of longer and more expensive licensing reviews by requiring that the NRC complete its safety and environmental reviews within congressionally-established milestones. Directing the NRC to act more expeditiously to review and conduct hearings on license applications is necessary to establish regulatory and fiscal discipline at the NRC. Specifically, amending section 185 of the Atomic Energy Act is necessary to require the NRC to complete its environmental and safety reviews in a timely fashion. The draft legislation establishes milestones of 24 months for completing environmental and safety reviews and 30 months for completing hearings on applications for new and renewed nuclear power plants. The NRC's previous issuance of construction permits for new nuclear power plants within about two years demonstrates that NRC can complete its reviews within a reasonable period without sacrificing the quality of its reviews.

FRED UPTON, MICHIGAN
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY
RANKING MEMBER

ONE HUNDRED FOURTEENTH CONGRESS
Congress of the United States
House of Representatives
COMMITTEE ON ENERGY AND COMMERCE
2125 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-6115
Majority (202) 225-2927
Minority (202) 225-3641

May 26, 2015

The Honorable Jeffrey S. Merrifield
Partner
Pillsbury Law Firm
1200 Seventeenth Street, N.W.
Washington, DC 20036

Dear Mr. Merrifield:

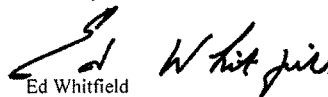
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During the hearing, Members asked you to provide additional information for the record, and you indicated that you would provide that information. Descriptions of the requested information are provided in the attached document. The format of your responses should be as follows: (1) the name of the Member whose request you are addressing, (2) the complete text of the request you are addressing in bold, and (3) your answer to that request in plain text.

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Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Ed Whitfield
Chairman
Subcommittee on Energy and Power

cc: The Honorable Bobby Rush, Ranking Member, Subcommittee on Energy and Power

Attachment

Submitted Answers of Jeffrey S. Merrifield
House Energy and Commerce Committee QFR
May 30, 2016

The Honorable Ed. Whitfield

Question: During your tenure at the NRC, you recommended the Commission reconsider requiring a mandatory hearing for new plant licensing. Will you tell us why you made that recommendation?

Answer: The origin of Section 189 (a) of the Atomic Energy Act, which requires a mandatory hearing for nuclear reactors, dates to 1957 when it was first introduced by Senator Clinton Anderson (D-NM) who was the then co-chair of the Joint Committee on Atomic Energy. Prior to its adoption, the Atomic Energy Commission had approved several nuclear reactors without any public involvement in the process. Senator Anderson felt that the Commission approval process should be conducted "out of doors" and that an adequate opportunity for public comment and involvement must be adopted. He was correct.

However, since that time, due to changes incorporated in the Administrative Procedures Act, as well as the NRC's internal procedures, there are a large number of opportunities for the public to be involved in virtually all stages of the licensing process consistent with the vision of Senator Anderson. Further, an individual who brings a valid contention raising concerns about the licensing of a nuclear reactor can seek a contested proceeding to challenge that license.

In order to meet the current Mandatory Hearing requirements, the Commission and its staff expend significant time and cost, with virtually no additional benefit. For the reasons outlined above, I believed and continued to believe that the Mandatory Hearing requirement in the Atomic Energy Act is an outdated anachronism and should be repealed.

A. Would the draft legislative provision limit transparency or public stakeholder existing rights to file contentions on licensing actions?

Answer: No, it would not. The NRC process would remain transparent and the ability of public stakeholders to file contentions would remain unabridged.

The Honorable Michael Doyle

1. Commissioner Merrifield, section 7 of Rep. Kinzinger's discussion draft sets a 12 month deadline for the draft environmental impact statement, and a 24 month cap on a complete review for the technical review and final environmental impact statement.

A. Do you think they times for review are appropriate?

Answer: I believe these timelines are appropriate and achievable as they relate to the environmental impact process. I further believe that the NRC staff will be challenged to conduct a technical review and issue a Final Safety Analysis Report in that timeframe. You may wish to consider a 36 month timeframe for a complete technical review and issuance of a FSAR.

B. Do you have any concerns that this could jeopardize the safety of these plants, or their potential impact on the environment?

Answer: No, I do not.

C. If the NRC signaled it needed additional time to review the application, what would happen?

Answer: As the legislation proposed by Representative Kinzinger does not provide a specific outcome for the failure of the NRC to meet the 24 month deadline (such as an automatic approval), it is unclear what recourse would be available to an applicant. From a practical perspective, if the Agency felt it needed additional time to consider the application, it would likely continue its review beyond the timeline included in the proposed legislation. I would prefer not to speculate how a District Court would respond to the Agency's failure to meet a statutory timeline.

2. Commissioner Merrifield, like you, I applaud the NRC for its current efforts under Project Aim to right size the agency. I also recognize that the NRC must stay true to its mission of protecting people and the environment. As someone who lived through very similar efforts to make the agency more efficient, can you comment on whether further efficiencies are feasible and desirable?

Answer: I genuinely believe that the Commissioners and their staff can identify further efficiencies and savings in operations at the NRC as I was intimately involved in a similar effort from 1998-2002 when the Agency undertook the same task. In order to accomplish this goal, the Commission will need to do what our Commission did at that time. We undertook a line by line review of the activities of the Agency and its staff, and we reviewed the specific positions needed to accomplish those tasks. We conducted a thorough prioritization of what was important to meeting the Agency's safety mission, versus that what was not. As a result of this review process, we were able to further identify savings consistent with meeting our mission.

I am not suggesting that this is an easy process, as it was not when I was a Commissioner. It will require the Commissioners to make some hard choices, including the potential for further reductions in staffing, but that is why Congress has given the Commissioners the responsibility for this role.

A. Do you feel that Project AIM and further efforts on that path would not compromise the safety the NRC has so diligently protected?

Answer: I do not believe that Project AIM and similar efforts to make the NRC more efficient would compromise the Agency's safety mission. I believe that further reductions in staffing, overhead and cost could be accomplished consistent with the Agency's goal of Protecting People and the Environment.

FRED UPTON, MICHIGAN
CHAIRMAN

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May 26, 2015

Dr. Todd Allen
Senior Fellow, Clean Energy Program
Third Way
1025 Connecticut Avenue, N.W.
Washington, DC 20036

Dear Dr. Allen:

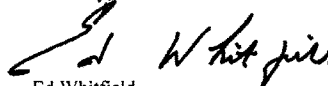
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Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Ed Whitfield
Chairman
Subcommittee on Energy and Power

cc: The Honorable Bobby Rush, Ranking Member, Subcommittee on Energy and Power

Attachment



June 2016

TO: The Honorable Ed Whitfield, Chairman, Subcommittee on Energy and Power

FROM: Todd Allen, Senior Visiting Fellow [REDACTED]

RE: Questions for the record from the April 29, 2016 hearing, at the Subcommittee on Energy and Power entitled "H.R. 4979, the Advanced Nuclear Technology Development Act of 2016 and H.R. _____, Nuclear Utilization of Keynote Energy Policies Act."

Member: The Honorable Ed Whitfield

The Department of Energy owns extensive nuclear testing facilities throughout its National Laboratory complex. How can those facilities be utilized in a manner to assist innovators in nuclear technologies develop the data and information to inform the regulatory process?

The National Laboratory complex maintains the critical capability to act as the nation's test bed for developing advanced nuclear concepts. A national test bed has two functions: first to provide specialized capability to prove a scientific or design principal (the Research and Development Test Bed function) and second to provide a location and potentially support services for hosting first-of-a-kind demonstration reactors (the Demonstration and Deployment Test Bed function).

For the R&D Test Bed, the National Laboratory complex provides:

- Experimental capabilities with primary emphasis on nuclear and radiological facilities but also other testing capabilities (e.g. thermal- hydraulic loops, control systems testing, etc.).
- Computational capabilities along with state-of-the-art modeling and simulation tools.
- Information and data through knowledge and validation center.
- Assistance through the regulatory process.

For the Demonstration and Deployment Test Bed, the National Laboratory complex provides:

- Assistance through the regulatory process.
- Land use and site information for demonstration facilities.
- Security and emergency response partnerships.
- A potential partner in power use agreements.
- Local research capability to address performance questions.

To act as an optimized test bed, the laboratory staffs require active research programs to keep their skills cutting edge. These research programs can assist multiple innovators by focusing on solving technical challenges that are faced by multiple companies. The national laboratory research programs can also act as a landing place for innovators whose concept does not reach commercialization, thus keeping technical skill in the national research complex. Finally, the national laboratories can act as hosts for communications and engagement initiatives that connect customers, communities, and policymakers with the innovation community.

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CHAIRMAN

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May 26, 2015

Mr. Geoffrey H. Fettus
Senior Attorney
Natural Resources Defense Council
1152 15th Street, N.W., Suite 300
Washington, DC 20005

Dear Mr. Fettus:

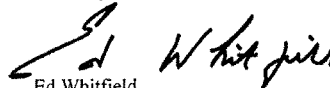
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cc: The Honorable Bobby Rush, Ranking Member, Subcommittee on Energy and Power

Attachment

**Responses to Questions for the Record on
“H.R. 4979, the Advanced Nuclear Technology Development Act
Of 2016 and H.R. __ , Nuclear Utilization of Keynote Energy
Policies Act”**

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**Before the
Subcommittee on Energy and Power
Committee on Energy & Commerce
United States House of Representatives
Washington, D.C.**

**April 29, 2016 Hearing
June 9, 2016 Responses**



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FROM THE HONORABLE ED WHITFIELD

Question 1: *Your testimony references a report from the Union of Concerned Scientists that showed mandatory hearings uncovered "multiple problems" during the hearings. When was this report issued? A. Since 1992, are you aware of any other instances in which multiple problems were identified in the mandatory hearing on an uncontested license?*

Answer to Congressman Whitfield's Question 1 and 1A

As noted in my April 29 testimony, I referenced the recent, April 21, 2016 testimony of Dr. Edward Lyman, a physicist at the Union of Concerned Scientists, before the Subcommittee on Clean Air and Nuclear Safety, Committee on Environment and Public Works of the U.S. Senate. Dr. Lyman's testimony in turn referenced a 2010 report on the salience and importance of mandatory hearings authored by Ms. Diane Curran, a longtime legal counsel before the NRC and federal courts from the law firm of Harmon, Curran, Spielberg & Eisenberg. Curran Report, *Response to NEI's 10/21/09 Wish List Regarding NRC Licensing Process*, , December 3, 2009. I have attached Ms. Curran's report on the topic for your reference at Attachment A.

Since 1992 there have been multiple instances where mandatory hearings identified crucial safety concerns that might otherwise not have been rectified. For example, in 2006 in the case of the Clinton Early Site Permit (ESP), the Atomic Safety and Licensing Board (ASLB) found the Staff's review "did not supply adequate technical information or flow of logic to permit a judgment as to whether the Staff had a reasonable basis for its conclusions(s)." *Exelon Generation Company, L.L.C.* (Early Site Permit for Clinton ESP Site), LBP-06-28, 64 NRC 460 (2006), reviewed in *Exelon Generation Company, L.L.C.* (Early Site Permit for Clinton ESP Site), CLI-07-12, 65 NRC 203 (2006). In another example, as part of the 2012 mandatory hearing process, the Commission rejected staff's evaluation of surveillance of the "squib valves,"¹ an essential safety component for the performance of the AP1000 reactor design being used at South Carolina's Plant Vogtle Units 3 and 4. Accordingly, the Commissioners imposed a license condition requiring implementation of a substantially more rigorous "squib valve" surveillance program prior to the first loading of nuclear fuel. See <http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2012/2012-02cli.pdf>.

FROM THE HONORABLE MICHAEL DOYLE

Question 1: *Mr. Fettus, in your testimony you oppose the removal of the mandatory public hearing included in Congressman Kinzinger's draft bill. My understanding is this legislation*

¹ For purely explanatory purposes, as described under *U.S. Patent US 5443088 A*, a "squib valve" is a "single action valve used for permitting rapid exit of a fluid from a pressurized fluid source. Squib valves are used to permit evacuation of a fluid stored under pressure. Typically, although not exclusively, squib valves are used to permit rapid release of fluids retained under a wide range of pressures, typically 1,000-10,000 psi. Squib valves are used, for example, in aircraft ejector mechanisms, missile firing mechanisms, missile fuel supply systems and fire extinguishing systems." See online at <http://www.google.com/patents/US5443088>.

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wouldn't remove the possibility of having a public hearing, and if affected parties request it, a hearing would still happen. Could you explain why this option is unsatisfactory to you?

Answer to Congressman Doyle's Question 1

I appreciate the question Congressman. As a first matter your question suggests that a public hearing will be held if any member of the public requests that one be held. Unfortunately, a request by the member of the public that can demonstrate standing does not trigger such a straightforward path forward for public review. As I will examine in some more detail, the bars to entrance for a public hearing are remarkably high. The public is expected to file a complete set of "contentions" and supporting expert declarations within sixty days after notice of filing of the application. It should be noted that the public, unlike NRC Staff, has no direct access to the applicant and therefore no ability to examine the underlying basis of the applicant's position on any matter, and has access only to a restricted set of public documents. This brief period of time for filing contentions is simply the first step in petitioning for a hearing – one that is challenged in every instance by NRC and industry – includes substantial substantive obligations regarding the technical basis for disagreement and the evidence upon which such disagreement is based. This initial petition also includes standing and procedural requirements that are at least (and if not more) strict than what is required in a Federal District Court. In effect, the current hearing rules work as a calculated strategy that imposes unreasonable and often unachievable evidentiary burdens as prerequisites to participation.

Therefore, the option of reducing the hearing oversight process solely to intervention by affected parties is unsatisfactory for several important reasons and I will elaborate on those reasons in the paragraphs that follow.

First, per your mention of the matter at the start of your question, the mandatory hearing process has been responsible for identifying safety problems and potential areas of concern that might not otherwise have been identified but for the mandatory hearing process. And, as noted in our initial testimony, it's clear the mandatory hearing process is neither a financial nor time sensitive burden on the industry and the agency.

Second, as I briefly explained above, the NRC's current public intervention process poses huge and often insurmountable burdens effectively preventing the participation of most public intervenors and even States that might seek to wade into what is termed a "strict by design" process. NRDC has detailed these difficulties to the Commission in 2013, but seemingly to little or no avail.² The hearing process is burdensome in the extreme for a State or for the public. In

² See, Christopher Paine, Nuclear Program Director, Natural Resources Defense Council; *How NRC Rules Suppress Meaningful Public Participation In NRC Regulatory Decision-making*; Before the Nuclear Regulatory Commission Rockville, Maryland, January 31, 2013; found online at https://www.nrdc.org/sites/default/files/nuc_13020601a.pdf.

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short, the NRC process is onerous and in need of reform to make it simpler and more likely to arrive at substantive issues.

First, following the Notice of Opportunity for hearing in the Federal Register, a prospective petitioner who believes [s]he may have an affected interest in the proceeding has *only 60 days* in which to: (1) study the voluminous license application and draft environmental report; (2) investigate any safety and/or environmental concerns they have identified in the report; (3) document his/her standing to pursue these concerns; (4) draft admissible safety and/or environmental contentions (these are the equivalent of a “count” in a federal complaint); (5) seek out technical declarations from experts to support these contentions, and (6) hire expert legal counsel to frame “with specificity” the contentions and their legal bases in ways that satisfy all the “strict-by design” pleading requirements of 10 CFR §2.309 (f).

Each one of these tasks is an extraordinary hurdle in a truncated time period, all taking place after the license applicant has worked with the NRC for years during the license acceptance review. Indeed, the generic licensing of the AP 1000 reactor design took a number of years and went through more than 17 design iterations – a fact entirely unrelated to the intervention of the public or a state.³ And after all of those years and exchanges of information between the license applicant and the agency, an interested member of the public must prepare what amounts to a fully formed case with expert support on a complicated topic that’s essentially a moving target (moving in the sense of multiple application iterations) in approximately two months. Further, in every instance the NRC staff aligns with the license applicant to file in opposition to each and every “contention” that is filed by the state or the public. Further, unlike a complaint in federal court that can be lodged “upon information and belief,” under the NRC hearing process that contention must be explicitly supported by expert testimony, whether the matter is a safety concern or an environmental concern raised under NEPA. Essentially, the burden for defending the viability of a license application is shifted from the industry (and its ostensibly independent regulator) to that of the public, who must prove not only standing to file the contention but go so far as to essentially make the case via expert before the process even starts and “party status” is granted.

And as high as the bar is for initial intervention contentions, there are yet more complications peculiar to the NRC process, and they can be found in the NRC’s tortured treatment of the National Environmental Policy Act (NEPA). Quite simply, the core concept in NEPA is that a federal agency must produce environmental impact statements (EIS) – the basic analysis of a major federal action’s impact on the environment, in this instance a nuclear facility or materials license – on a timetable that allows the environmental considerations to be explored and commented upon by the public and then considered on a schedule that meaningfully informs agency decision-making with respect to the proposed action. Council on Environmental Quality

³ See, *Nuclear Power: Still Not Viable Without Subsidies*; Doug Koplow, Earth Track, Inc., Union of Concerned Scientists, February 2011, at 46, n. 48; found online at http://www.ucsusa.org/sites/default/files/legacy/assets/documents/nuclear_power/nuclear_subsidies_report.pdf.

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(CEQ) rules prohibit *ex post facto* use of environmental impact statements to justify decisions already taken. So, this requires the agency to determine—early in the agency’s decision process and with public input—the appropriate scope of its required environmental analysis. After which, the agency prepares a draft statement for public comment outlining various reasonable alternatives for implementing its proposed action that would either prevent, reduce, or mitigate harmful environmental impacts, and identifying the agency’s preferred alternative, if it has one. Then typically at least 30 days prior to any formal “Record of Decision” to move forward with implementing the proposed action, the Agency must issue a EIS that responds to the public comments received, and identifies any changes to the draft analysis or preferred alternative. It sounds simple enough and it is with many federal agencies.

But NEPA doesn’t work like this at the NRC, and some of the provisions in the Discussion Draft would make matters – already untenable – worse. Turning back to the initial and onerous process for lodging the initial contentions and supportive expert testimony, the Committee should be aware that the NRC staff doesn’t author the initial “first draft” of its NEPA documentation. Unfortunately, under the NRC’s system, licensees (or even potential licensees) rather than NRC staff are actually preparing the regulator’s own “hard look” at the environmental consequences of its licensing actions. Indeed, it’s the industry itself that produces an Environmental Report (ER), a document that stands in as the first cut of the project’s demonstration of compliance with NEPA. Intervenor must challenge aspects of the ER *as if it were the government’s NEPA document itself*. And if Intervenor don’t identify and bring full expert support to bear (again, in 60 days) on those flaws, they are barred from ever raising those matters in the future. After both the industry and the agency staff inevitably attack the intervention petition and the original contention on procedural and/or substantive grounds (usually both), if one or more of those contentions survive, the agency produces a Draft EIS, and the burden is shifted to the intervenor to attempt to “migrate” or amend its contentions to the draft NEPA document. Again, the time period is truncated and expert support must be marshalled. And, inevitably, the industry and agency staff again team up to challenge the migration or amendment of the contentions. And the same process happens again for the issuance of the Final EIS.

And to make the intervention process with NRC even more complicated, when the draft or final EIS is eventually produced by NRC Staff and the parties to the proceeding file new or amended contentions regarding the new document, they can do so only to the extent that there are “data and conclusions in the NRC draft or final [EIS], environmental assessment, or any supplements relating thereto, *that differ significantly from the data or conclusions in the applicant’s documents.*” This requirement places a potentially error-inducing premium on the Staff’s EIS to demonstrate consistency with an Applicant’s flawed ER, thereby insulating the EIS from further challenges. In other words, flaws not previously identified by intervenors in the ER may actually be preserved and replicated in the EIS, with the official endorsement of the NRC’s own rules.⁴ If

⁴ Say, for example, if the public or the state intervenor do not identify the problem at the very outset and challenge it (and in turn inevitably be challenged by staff and the industry for having lodged the contention in the first instance), then whatever flaw exists in the ER gets the veritable stamp of agency approval. This is so because as no party raised the matter, it’s unlikely in that NRC staff would alter a

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a state or a member of the public fails to satisfy this (dysfunctional) criterion, intervenors can file new or amended contentions “only with leave of the presiding officer,” upon a showing that the contention is based on information that was not “previously available,” is “materially different than information previously available,” and has been submitted “in a timely fashion based on the availability of the subsequent information.”

Again, instead of the license applicant carrying the burden of demonstrating that a license is merited and in compliance with the law, the potential intervenor has a nearly impossible, expensive and burdensome set of tasks simply to get in the door, much less arrive a substantive resolution of the relevant safety or environmental concerns. And under the provisions of the draft legislation hearings in any form would only happen as a result of successfully navigating this process and becoming an intervenor.

In short, the NRC system requires potential intervenors, whether a small public interest group or an overburdened state government to commit significant legal resources to gain entry into the licensing process at the outset—in some case years earlier than necessary—if they want to protect their future appeal rights under NEPA (or the AEA for that matter). Comments on the Draft EIS from non-parties to the proceeding – that is, persons or governments that choose not to intervene or miss the opportunity – are barred from raising their environmental concerns in the Court of Appeals, and thus are essentially ignored by the Commission. And while state and local officials and tribes, within whose jurisdictions the license applicant’s facility is located, are granted (only) standing by rule, this does not help them that much, as they and all other persons with environmental concerns must still surmount all the previously enumerated procedural hurdles to achieving an admissible contention. We fail to see the beneficial purpose to be served by such nit-picking exclusionary rules.

Rather than continue to countenance exclusionary rules that sweep important issues raised by states or the public off the table years before they can be substantively adjudicated, we urge Congress to work with the NRC, the industry states and members of the public to improve the hearing process. Indeed, the current rules artificially constrain adjudication of the merits of environmental issues surrounding the start-up or extended operation of nuclear power plants and other production and utilization facilities. A proliferation of procedural rules designed to bat

position at the time of filing the draft EIS or especially the final EIS, as such a declaration of change would allow for the potential filing of a contention. Even more problematically, even if the issue is raised at the outset by an intervenor, and successfully brought through all the adjudicatory stages, the NRC staff has repeatedly relied on the hearing process or decisions of the Atomic Safety & Licensing Boards to ostensibly “cure” any fundamental legal defect, thereby attempting to inoculate the agency against judicial review. *See, e.g., In the Matter of Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-15-3, January 23, 2015, (“Yet, despite Joint Intervenors’ assertions to the contrary, (“The defense of the FSEIS must be confined to materials before the agency at the time the FSEIS was issued.”), the Board does not find that the absence in the FSEIS of the information on uranium concentrations renders the NEPA process legally deficient. Rather, the post-restoration uranium concentration levels reported in the staff’s prefiled testimony supplements the FSEIS so as to cure any defect in that regard.”), at 68-69 (citations omitted). Decision found online at <http://www.nrc.gov/docs/ML1502/ML15023A566.pdf>.

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away issues before they can be considered on their merits lends credence to the supposition that the NRC is entirely captured agency.

We stated at the hearing that rather than ensuring NRC's licensing process continues to become yet more expedient for industry and more of a restricted venue for States and the public, Congress should be directing NRC to submit a substantially redesigned adjudicatory hearing process that simplifies the hearing requirements to for substantive, technical issues of safety or environmental concern come to fore rather than entertaining joint industry-Staff efforts to flyspeck, curtail or have dismissed literally every contention that has ever been filed before the Atomic Safety & Licensing Board. Such would new hearing process would (1) allow for more than one opportunity for intervention (for example, with release of the Draft Environmental Impact Statement along with the submission of the license application) and (2) a less administratively burdensome set of contention filing requirements (akin to Federal Civil Procedure "notice pleading") to resolve onerous issues with demonstrated standing.

In 2008 a long-serving ASLB Judge wrote:

The Petitioners were instrumental in focusing the Board's attention on the troubling matters discussed above. That they did so is a testament to the contribution that they, and others like them, can make to a proceeding. Moreover, in doing so they often labor under a number of disadvantages.

In the Matter of Shaw Areva Mox Services (Mixed Oxide Fuel Fabrication Facility), LB-08-11, Docket No. 70-3098-MLA, at 49 (June 27, 2008) (Farrar, J., concurring).

Thank you for your questions and we look forward to continuing to work with the Committee on this important topic.

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Memo

From: Diane Curran

Re: Response to NEI's 10/21/09 Wish List Regarding NRC Licensing Process

Date: December 3, 2009

The Nuclear Energy Institute's (NEI's) proposal to "streamline" the U.S. Nuclear Regulatory Commission's (NRC's) licensing process for new nuclear reactors (*see* Legislative Proposal to Help Meet Climate Change Goals by Expanding U.S. Nuclear Energy Production, 10/21/09), in fact constitutes an effort to eliminate the sole remaining avenue for public involvement in the siting of nuclear power plants in communities across America. NEI sets up a false target: what is delaying the processing of reactor applications now is not hearings but the fact that the industry has been unable to submit adequate generic design proposals or to respond in a timely fashion to NRC hearings.

Here are some realities that the NEI proposal ignores:

1. Nuclear reactors already have the most streamlined licensing process of any type of industrial facility in the U.S. For no other technology has the federal government imposed the unique structure of federal preemption that precludes any state from regulating the major emission from a plant.
2. Licensing hearings have never been a serious source of reactor licensing delay. For the first generation of nuclear reactors, licensing hearings – although often contentious – always went on while the reactors were being built and had concluded by the time the reactor was ready to operate. Furthermore, the hearings process has at all times been overseen by an NRC majority that is very supportive of the nuclear industry. Impartial studies in the 1970s and 1980s showed that not a single reactor was being delayed by licensing hearings. In the 1990s, when the last generation of reactors had been completed, only two operating licenses were delayed by hearings: Shoreham and Seabrook. Both of these plants had such serious emergency evacuation problems that they were opposed by the governors of New York and Massachusetts. Indeed, Shoreham never operated.
3. The NRC has already dramatically "streamlined" its hearing process. Over the past ten years, the NRC has established one-step licensing regulations that are designed to speed up the licensing process by providing for the use of rulemaking to approve generic designs, which can then be incorporated into individual combined construction permit and operating license applications (COLAs). Designs incorporated into individual COLAs are shielded from challenge in public hearings, thereby expediting the hearing process. Furthermore, the NRC has already stripped the public of the rights to cross examine and undertake discovery of documents that existed in all reactor licensing hearings prior to the recent changes.
4. Public involvement in NRC hearings has often led to significant safety improvements. The chairman of the NRC's Atomic Safety Licensing Boards described the benefits of the NRC public hearing process as follows in 1981: "(1) Staff and applicant reports subject to public

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examination are performed with greater care; (2) preparation for public examination of issues frequently creates a new perspective and causes the parties to reexamine or rethink some or all of the questions presented; (3) the quality of staff judgment is improved by a hearing process which requires experts to state their views in writing and then permits oral examination in detail. B. Paul Cotter, Memorandum to NRC Commissioner Ahearn at 8 (May 1, 1981). Judge Cotter's conclusion echoes the independent analysis of the Three Mile Island nuclear accident commissioned by the NRC, which stated that: "Intervenor have made an important impact on safety in some instances – sometimes as a catalyst in the prehearing stage of proceedings, sometimes by forcing more thorough review of an issue or improved review procedures on a reluctant agency." Mitchell Rogovin and George T. Frampton, Jr., *Three Mile Island: a Report to the Commissioners and to the Public*, Vol. 1 at 143-44 (1980).

5. Any delays in the NRC's licensing process are due to the industry's failure to fulfill the key prerequisite for effective use of the one-step licensing process: submission of complete and adequate standardized designs well in advance of individual license applications. Instead, the industry has submitted incomplete generic design approval applications, such as the inadequate AP1000 design. Not surprisingly, the licensing proceedings for the COLAs that rely on these inadequate designs have been delayed, as the NRC and design vendors haggle over problems that should have been resolved long before the COLAs were submitted.

Instead of acknowledging the real problem, NEI is asking Congress to further expedite the hearing process and eliminate mandatory hearings. Not only would the requested changes be ineffective in addressing the real cause of licensing delays, but they would significantly reduce the rigor of the licensing process and fatally undermine the public's already-shaky confidence in the NRC.

One of NEI's most egregious proposals is to eliminate the mandatory hearing required by the Atomic Energy Act for construction permits. The NRC must hold a hearing on all issues that are relevant to the issuance of a construction permit, regardless of whether a member of the public requests a hearing. The scope of the mandatory hearing covers all issues that were uncontested by any member of the public. The mandatory hearing requirement applies to COLAs because they include construction permits. Thus, for a single reactor COLA, the NRC may hold one mandatory hearing, or it may hold two hearings: one on contested issues and a mandatory hearing on uncontested issues.

-While NEI calls the mandatory hearing an "artifact of the old two-step licensing process," in fact – as the NRC has recognized – the mandatory hearing remains an important tool for establishing both safety and public confidence in the NRC's regulation of the construction of new reactors. In 2006, the NRC weighed the discretionary imposition of a mandatory hearing requirement on licenses to manufacture new reactors, even though the Atomic Energy Act does not technically require a mandatory hearing in those cases. Proposed Rule, Licenses, Certifications, and Approvals for Nuclear Power Plants, 71 Fed. Reg. 12,782, 12,836 (March 13, 2006). After taking comments, the Commission decided not to adopt the requirement on the ground that because manufacturing of pre-

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built reactors takes place in a different location from construction and operation of the finished plants, those licensing proceedings are unlikely to generate stakeholder interests. As the Commission reasoned, “[i]f there is no stakeholder interest in a hearing, transparency and public confidence would not appear to be relevant considerations in favor of holding a mandatory hearing.” Final Rule, Licenses, Certifications, and Approvals for Nuclear Power Plants, 72 Fed. Reg. 49,352, 49,367-68 (August 28, 2007).

In contrast to the manufacturing licensing process, the one-step licensing process for new reactors and their standardized designs is a matter of great importance to public stakeholders, as reflected by the fact that hearings have been requested in virtually every combined license application (COLA) that has been submitted for a new reactor under the one-step licensing process. The mandatory hearing plays a crucial role of supplementing the contested hearing process, in which few issues – and sometimes no issues – survive the gauntlet of NRC’s arduous procedural requirement for admission of issues to a hearing. Where members of the public raise concerns that are rejected for contested hearings, they can only turn to the licensing board for a rigorous independent evaluation of the adequacy of the NRC Staff’s review of a license application.

The mandatory hearing is all the more important given that, as discussed above, the NRC is undertaking individual license application reviews before the underlying designs have been reviewed or approved. The NRC’s decision to conduct individual COLA reviews before it has approved their underlying generic designs creates uncertainty and confusion in the relationship between reactor designs and individual COLAs. A number of other factors further heighten the importance of the mandatory hearing: (a) the pivotal role of a nuclear reactor’s design in determining its safety, (b) the novel and untested nature of the new designs, and (c) the relationship between design and siting issues.

Mandatory hearings have a proven track record of highlighting weaknesses in the NRC Staff’s review process for early site permits (ESPs), as well as regulatory questions requiring resolution by the Commission. For example, in the case of the Clinton ESP, the Atomic Safety and Licensing Board (ASLB) found that the Staff’s review “did not supply adequate technical information or flow of logic to permit a judgment as to whether the Staff had a reasonable basis for its conclusions(s).” *Exelon Generation Company, L.L.C.* (Early Site Permit for Clinton ESP Site), LBP-06-28, 64 NRC 460 (2006), reviewed in *Exelon Generation Company, L.L.C.* (Early Site Permit for Clinton ESP Site), CLI-07-12, 65 NRC 203 (2006).

The ASLB sent to the NRC Staff more than 200 requests for additional information and also required additional briefing by the Staff and Exelon. While the Board ultimately recommended that the ESP be granted, its Initial Decision it found numerous deficiencies in the quality of the Staff’s review, including:

- A “plethora of instances in which the Staff’s conclusions could only be characterized as conclusory.” 64 NRC at 480.

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- Failure, in a “large number of instances,” to “logically connect facts to conclusions.” 64 NRC at 481.
- Failure to follow “the prescribed [Standard Review Plan] and regulatory guide procedures.” 64 NRC at 481.
- “Many instances for which the Staff advised [the Board] that it had indeed followed the [regulatory] guides, but the Staff’s logic and stated facts appeared to be inadequate to make the required determination that its ‘review was sufficient’ to support the required findings.” 64 NRC at 481.
- In addition to a “lack of a clear logic flowing from the facts recited in the FSER to the conclusions the Staff reached,” a “large number of instances wherein the Staff appeared to simply accept, without checking or verifying, the facts stated by the Applicant.” 64 NRC at 491.
- In a “material number of instances,” failure of the NRC Staff’s internal work product to “rise to the level produced by contractors.” And the quality of the work product “might not have risen to a desirable level at all without [the Board’s] probing and prodding.” 64 NRC at 496.
- “[U]ntil a number of months into this review, the Staff fought [the Board’s] requests for information at every turn. This was counterproductive, led to material delays, and shifted workload for the Staff, the Applicant, and the Board toward the end of the proceeding.” 64 NRC at 497.

In the case of the Early Site Permit for North Anna, the ASLB found that the Final Environmental Impact Statement (“FEIS”) contained a “paucity of analysis, investigation, and information” regarding the subject of Environmental Justice. *Dominion Nuclear North Anna, L.L.C.* (Early Site Permit for North Anna ESP Site), LBP-07-9, 65 NRC 539, 621 (2007), reviewed in *Dominion Nuclear North Anna, L.L.C.* (Early Site Permit for North Anna ESP Site), CLI-07-27, 66 NRC 215 (2007). In a dissenting opinion, ASLB Judge Alex Karlin criticized the Final EIS for failing to provide an adequate analysis of alternative sites and system design alternatives. 64 NRC at 631. While the Commission ultimately approved the adequacy of the Staff’s alternatives analysis, it ordered the Staff to provide more details in future Final EISs. CLI-07-27, 66 NRC at 230.

Thus, NEI has no grounds for characterizing mandatory hearings as a “redundant and unneeded ‘review of the Staff’s review.’”

NEI implies that the mandatory hearing is the equivalent in time and resource consumption of a contested hearing, where the adequacy of the application itself is at issue. But the scope of a mandatory hearing is restricted to the sufficiency of the record and the adequacy of the NRC Staff’s review to support the Staff’s proposed conclusions regarding the license application. LBP-07-9, 65

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NRC at 555. Thus, the Commission has established procedures and processes for mandatory hearings that ensure that they have a reasonable scope.

Accordingly, the mandatory hearings established under the Atomic Energy Act constitute a necessary and important element of the NRC's process for maintaining accountability to the public in the hearing process which should not be eliminated.